

AIDS TO MEDICINE

PART II.



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AIDS TO MEDICINE.

PART II. (Double Part).

THE PATHOLOGY OF THE URINE, DISEASES OF
THE KIDNEYS, PANCREAS, SPLEEN, MOUTH,
ÆSOPHAGUS, STOMACH, INTESTINES,
PERITONEUM, AND THROAT.

BY

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PREFACE.

IN preparing this, the second edition of "Aids to Medicine," Part II., the work has been very carefully revised, in great part rewritten, and much extended.

The following pages really consist of an abstract of lectures delivered, during many years past, to pupils preparing for the Royal College of Physicians and other medical examinations.

The contents of the work are *not* intended to supply the place of the exhaustive manuals on the subject, but it is hoped they may be found useful as an introduction to the study of Medicine, and may provide the student with a means of refreshing the memory after his severe work has been carefully and conscientiously performed.

ARMAND SEMPLE.

8, TORRINGTON SQUARE, W.C.,

March, 1884.

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AIDS TO MEDICINE.

THE PATHOLOGY OF THE URINE.

IN health the composition of the urine in 1000 parts may roughly be estimated as follows :

Water	...	...	...	...	...	950
Urea	...	...	...	...	...	25
Uric Acid	...	...	...	...	...	1
Fixed Salts	{	Chloride of Sodium	...	...	}	14
		Salts of Ammonia	...	...		
		Alkaline Phosphates	...	...		
		Alkaline Sulphates	...	...		
		Phosphates of Lime and Magnesia	...	...		
Organic Matters	{	Extractive	...	...	}	10
		Creatine and Creatinine	...	...		
		Colouring Matter	...	...		
						1000

The quantity of urine normally excreted by an adult in 24 hours is about 1 to 2 pints and a half, or 20 to 50 ounces ; but it may exceed this average by the ingestion of large quantities of fluids, as in beer

drinkers ; in winter ; and in individuals of sedentary habits. It is pathologically increased in diabetes and hysteria. It may be below the average in summer, and generally under all conditions by which the amount of perspiration and pulmonary exhalation is increased. It is pathologically diminished in acute febrile diseases, and in all diseases attended by dropsical effusions or watery discharges. The colour of the urine varies physiologically as follows :

The greater the quantity of urine voided, the lighter, as a rule, is the colour.

Urine voided in the morning is darker than that at other times. The use of certain drugs imparts a peculiar colour to the urine : rhubarb gives *bright yellow* ; logwood, *reddish* ; senna, *brownish* ; santonin, *orange-red* or *golden-yellow*.

Pathologically the urine is rendered pale in anæmia, and in those conditions which produce an increase in the quantity, and it is similarly heightened in colour under those conditions in which the quantity of water eliminated by the kidneys is diminished, while the elimination of the solids remains normal, or is increased.

The presence of bile may render the urine brown, or even black.

The specific gravity of healthy urine varies from 1015 to 1025 ; but after copious drinking upon an empty stomach the specific gravity may fall as low as 1001, and again it may rise to 1030 after a full meal.

The urine of females is usually slightly lower in specific gravity than in males, except during pregnancy, at which period the specific gravity is normally about 1030.

The urine of herbivorous animals is alkaline in reaction, whilst in the carnivorous it is strongly acid.

In man its reaction is faintly acid, since his food is a blending of animal with vegetable substances.

The colour of the urine is probably due to at least two colouring matters, *Urobilin* and *Indican*.

It may become alkaline by exposure to air after some days, its urea being converted into carbonate of ammonia ; or it may be rendered alkaline by remedies, as carbonate of lime or magnesia, or its acid condition may be lessened by constant vomiting in certain diseased states of the stomach, or when the urine is loaded with pus.

It may also be alkaline after a full meal, the digestion of food absorbing the gastric juice. Alkaline urine turns yellow turmeric brown.

Urea in excess gives urine a high specific gravity (1030—1035). This substance may be detected by adding strong nitric acid or oxalic acid to urine. If kept cool, nitrate or oxalate of urea crystals are formed. The former of these appears in the form of scales, which are composed of numerous rhomboidal plates ; the latter also take the form of rhomboidal plates, but the angles are much less acute.

From the preceding table it will thus be observed that about one-half of the solid matter of the urine consists of urea.

Now, urea is theoretically formed by the oxidation of uric acid, so when this oxidation does not take place, and there is an excess of uric acid in the system, as occurs in gout, this disease is termed one of *sub-oxidation*.

In considering the pathology of the urine, we may conveniently divide the subject into two sections :—

(1) THE MORBID DEPOSITS.

(2) THE MORBID CONSTITUENTS.

THE MORBID URINARY DEPOSITS.

These are the following :—

- | | |
|----------------|--------------------------|
| 1. Urates. | 5. Cystine. |
| 2. Uric Acid. | 6. Leucine and Tyrosine. |
| 3. Oxalates. | 7. Pus. |
| 4. Phosphates. | 8. Mucus. |

URATES OR LITHATES (*λίθος*, a stone).

These usually consist of urate of soda and ammonia, and are the most common urinary sediments, being occasionally passed by almost everybody. They are found in the course of most fevers, in liver diseases, in rheumatism, and in gastric disturbance, but *per se* they do not indicate anything serious. There are two varieties,—the pink, and the white. The pink lithate forms the so-called *brick-dust sediment*, and is best treated by anti-dyspeptics, but the white variety yields more readily to tonics.

Tests.—(1) Lithate of ammonia is soluble in liquor potassæ with evolution of ammonia, but

(2) All lithates are dissolved by heat and thrown down in the cold.

Microscopically.—Lithate of ammonia appears as *feathery amorphous bodies*.

Lithate of soda sometimes forms spherical masses, from parts of which very small needle-shaped crystals of uric acid project.

Lithate of soda is commonly met with in children's urine in a globular form.

URIC OR LITHIC ACID.

An excess of this acid constitutes the *Uric Acid Diathesis*, the leading characters of which are gout, gravel, and dyspepsia, and the urine is always decidedly acid, whilst in health it gives only a faint acid reaction. Uric acid may occur as a deposit (gravel), forming the *cayenne-pepper grain* deposit, or as a concretion (calculus). The red colour of the grains is adventitious, being acquired from the colouring matter of the urine. The real appearance of uric acid is white.

Tests.—(1) Uric acid is dissolved (without evolution of ammonia) by liquor potassæ and liquor lithiæ, but not by liquor sodæ or liquor ammoniæ.

(2) The formation of the *Purpurate of Ammonia* or *Murexide* is as follows:—A few grains of the deposit are placed upon a glass slide, with a drop or two of strong nitric acid, and the whole evaporated to dryness, and thus *Alloxan* is formed. This alloxan is now exposed to the vapour of ammonia and the *Purple Murexide* results. Uric acid is insoluble in water, but is supposed to be held in solution in the urine by the action of the phosphates.

Microscopically.—Uric acid usually appears as a *rhombus with rounded edges* (lozenge-shaped), or as a *dumb-bell with fringed extremities*, always of a yellow or reddish colour, but some crystals are at times halberd-shaped or needle-shaped.

OXALATE OF LIME.

The presence of this salt in the urine constitutes *Oxaluria*. It is not found in healthy urine, but its

elements, carbon, oxygen, and calcium, are present, and give rise to the *Mulberry Calculus*. Oxaluria often does not indicate anything serious, but is usually associated with dyspepsia and gastric disturbance. It is not unfrequent to find, upon the same microscopic specimen, crystals of oxalate of lime lying side by side with those of uric acid.

Tests.—(1) Oxalates are dissolved by nitric acid, but not by acetic acid, or by liquor potassæ.

(2) They are converted by the blow-pipe into carbonates.

Microscopically.—Oxalates present a white deposit, consisting of *square octahedra* and *dumb-bells* without fringed extremities.

PHOSPHATES.

These form a white deposit, and occur in the urine under three forms, viz. :—

- (A) **The Triple or Tribasic Phosphate, or Ammonio-Magnesian-Phosphate** appearing under the microscope in the form of triangular prisms with obliquely truncated ends. Frequently the crystals are four-sided, and sometimes peculiar forms are observed in which two prisms appear united.
- (B) **The Basic, Bibasic, or Triple Phosphate with Excess of Ammonia**, microscopically presenting stellate crystals, and thus sometimes called the star-shaped phosphate: they after a time assume the prismatic form.
- (C) **The Phosphate of Lime**, occurring as rounded particles, usually clinging to the angles of the triple phosphate.

Phosphorus and phosphoric acid abound in the human body. The brain especially is composed of phosphorus and phosphuretted fat. The blood also contains phosphorus.

Upon adding a few drops of ammonia to healthy urine it becomes turbid, and deposits the triple salt with phosphate of lime.

Phosphaturia is the name applied to the condition in which the urine contains any considerable excess of phosphates. The presence of a small deposit of phosphates in the urine is always an indication of depression and debility, but a large quantity always shows a waste of tissue, and may be considered as caused by a breaking up of the mind and body.

Tests.—(1) They are precipitated by heat or liquor potassæ. (Thus distinguished from white lithates.)

(2) They are soluble in acetic and nitric acids.

Thus distinguished from oxalates, which, although soluble in nitric acid, are *not* dissolved by acetic acid.

CYSTINE, OR CYSTIC OXIDE.

This is an organic compound of a fawn colour, containing carbon, hydrogen, and nitrogen, with a large and equal quantity of sulphur and oxygen (26 per cent. of each). It is probably a derivative of albumen, and constitutes a form of urinary calculus, but very rarely occurs as a deposit. The urine containing it usually possesses an odour of sweet-briar. Cystine is often found mixed with uric acid and the urates.

Test.—Cystine is soluble in liquor ammoniæ, but is re-precipitated unchanged upon the spontaneous evaporation of the ammoniacal solution.

Microscopically, the deposit exhibits *six-sided colourless*

plates, which, if very abundant, are aggregated together so as to form superimposed plates.

LEUCINE AND TYROSINE.

These substances are very rare indeed, but are found in the urine in cases of acute yellow atrophy of the liver.

Microscopally, leucine occurs in gland-like masses of leaves or scales, and Tyrosine appears as shining, long needles clustered together.

PUS.

This occurs as a white deposit, and is a frequent indication of chronic pyelitis, especially when mixed with blood.

Test.—Pus forms a glairy mass with liquor potassæ.

Microscopically, the pus corpuscles are observed. These resemble the white globules of the blood, but are somewhat rougher in outline, and contain more nuclei; but some recent authorities regard them as identical.

MUCUS.

This also forms a glairy mass with liquor potassæ, but the microscope shows its true nature.

In perfectly healthy urine a slight cloudy deposit of mucus is occasionally present, and microscopically the epithelial cells are apparent; if they proceed from the bladder they are flat and scaly, if from the urethra, columnar.

THE MORBID URINARY CONSTITUENTS

are the following :—

1, BLOOD ; 2, BILE ; 3, ALBUMEN ; and 4, SUGAR.

BLOOD.

The presence of this substance in the urine is termed

HÆMATURIA (*αἷμα*, blood ; *ὀυρῆω*, to void urine).

Causes.—Congestion of the kidneys or any part of the urinary organs, either idiopathic, or produced by cantharides, turpentine, etc., may cause hæmaturia. The most frequent cause is a calculus, but a diseased prostate, inflammation of the bladder, or tumours (cancerous and otherwise) in the mucous membrane, may cause the presence of blood in the urine. Again, hæmaturia may occur in the course of purpura, typhus, and scarlet fever, or it may be vicarious of menstruation. In the hæmorrhagic diathesis, large quantities of blood may be discharged by the vagina or penis, or by the nose (epistaxis).

Indications.—When the blood proceeds from the bladder, it generally follows a flow of urine ; when from the kidney, it is intimately mixed with the urine.

The treatment will consist in the exhibition of ergot of rye, gallic acid, acetate of lead, and other remedies for staying hæmorrhage.

Tests.—For blood :

(1) Its coagulability by heat and nitric acid, throwing down a dirty-brown coagulum.

(2) Its red colour.

(3) The heightening of the colour by liquor ammoniæ, a crimson tint being produced.

- (4) The corpuscles under the microscope.
- (5) The dark bands in the spectrum.
- (6) The *blue* colour produced with blood by fresh tincture of guaiacum and ozonised ether (the peroxide of hydrogen test).

BILE.

This substance gives to the urine a dark-brown colour, varying in the depth of its shade according to the amount of bile present.

Bile may be present in the urine from one of two conditions ; either from—

1. *Suppression* of the biliary functions, in which case the blood is charged with the colouring matter of the bile and with cholesterine ; or, from

2. *Obstruction* to the bile-flow into the duodenum, in which case the matters generated in the liver itself, viz., the bile acids appear in the urine.

Tests.—(1) A few drops of nitric acid added to the bile-stained urine, upon a white porcelain plate, produce an *Iridescent Play of Colours*.

(2) If strong sulphuric acid, $\frac{1}{2}$ drachm, with a small fragment of loaf sugar, is added to about 2 drachms of similar urine, *suppression* will be indicated by a *mere browning* of the sugar, whereas *obstruction* will be shown by a scarlet or purple colour at the junction of the two fluids, due to the bile acids becoming oxidised.

ALBUMEN.

The presence of this substance in the urine constitutes

ALBUMINURIA.

Causes.—The most common causes are cold, scarlatina, and intemperance ; but albuminuria may occur

during epidemic cholera, diphtheria, pulmonary tuberculosis, articular rheumatism, typhus and typhoid fevers, erysipelas, measles, and pregnancy.

Tests.—(1.) Heat and nitric acid will independently coagulate or throw down albumen, but these reagents should be added together, since either, separately, may give a fallacious result. Phosphates, when in excess, are thrown down by heat, but dissolved by nitric acid, and nitric acid may cause a turbidity in urine containing an essential oil, as copaiba or cubebs. This oil may be separated by ether, and the urine will then have its usual reaction.

(2.) Place some urine in a test-tube, incline it gently, and allow a little nitric acid to trickle to the bottom slowly. Three strata will appear if the fluid is albuminous: at the bottom, colourless nitric acid; above this, coagulated albumen; at the top, unaltered urine.

(3.) Some nitric acid may be placed at the bottom of a test-tube, and the urine poured gently on the top; at the line of junction of the fluids a white line of albumen will appear.

If the urine is alkaline, heat will not affect the albumen until a drop or two of acetic acid is added; or the presence of a drop or two of nitric acid in the tube may redissolve the albumen upon the subsequent addition of nitric acid. The acid condition is shown by blue litmus, which is then turned red.

(4.) Picric acid in powder precipitates albumen, a reaction not interfered with by the presence of phosphates or urates. This test is so very delicate that it will detect a minute trace of albumen, irreconisable by the nitric acid or heat method.

SUGAR.

When sugar is found in the urine, the condition is known as diabetes mellitus, or glycosuria, since glucose, or grape-sugar, is the variety present.

DIABETES (*διὰ*, through ; *βαίνω*, to pass).

There are two varieties of this disease described by authors, viz. :

(a) DIABETES INSIPIDUS, HYSTERICAL, OR THE NON-SACCHARINE.

(b) DIABETES MELLITUS, GLYCOSURIA, OR THE SACCHARINE.

DIABETES INSIPIDUS occurs in hysterical persons : a very large quantity of almost colourless urine is passed, but its specific gravity is very low (1001—5), and it contains *no* sugar. It is not a condition of much pathological importance.

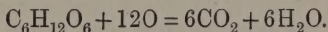
DIABETES MELLITUS.

Symptoms.—The first symptom to attract attention is a constant desire to pass water. A very much larger quantity of urine than normally is passed daily—the normal quantity being 30 or 50 ounces, in some cases there may be as many pints as there are usually ounces. There is ravenous appetite, with intense thirst, dyspepsia, and constipation. The tongue is red, with a brown streak down the centre ; the gums are red and tender. An odour of new-mown hay is often observed in the breath. The skin is harsh and dry, and the patient is notably emaciated. Carbuncles sometimes appear in various parts of the body, and ocular cataract has been observed. These symptoms may continue for many months, or even years ; death in general occurs from pulmonary phthisis, or the induction of an apoplectic seizure.

The Theory of Diabetes.

The pathology of this disease is extremely obscure, and post-mortem examination reveals very little. The kidneys may be enlarged, flabby, and congested. The disease would appear to be one of mal-assimilation, or suboxidation, or a perversion of the healthy function of the liver.

Claude Bernard's view is the following. In health, the portal circulation carries off from the stomach some of the products of digestion, *i.e.*, starchy matters and dextrine (a modification of starch). The latter is carried to the liver, and converted into glucose, hence the origin of the glycogenic function of the liver. Since this glucose is elaborated in the hepatic cells, it receives the name of heptatin. The blood containing the heptatin is conveyed by the hepatic vein into the inferior vena cava, and thence through the right side of the heart to the lungs, and still contains this heptatin or glucose throughout its whole course ; but the blood returning from the lungs is found to contain no sugar. The assumption is, therefore, that the glucose ($C_6H_{12}O_6$) acquires in the lung more oxygen, and is burnt off as carbonic anhydride (CO_2) and water (H_2O), thus—



In diabetes mellitus this combustion evidently does not take place, and hence the vessels passing from the lungs into the left side of the heart still contain sugar, which is found in the urine.

Another theory supposes diabetes to be a brain disease, since irritation of the fourth ventricle has produced an increase of sugar in the urine.

Pavy considers the process a post-mortem event. He thinks that the hydrocarbons taken up with the food are normally stored up in the liver, under the form of glycogen, which is changed into fat and not into sugar; the fat serving for the formation of bile. When the conditions are abnormal, the glycogen is converted into sugar, diabetes being thus occasioned. It is extremely probable that the greater number of cases of diabetes have a nervous origin; but it must be admitted that some cases may proceed primarily from the digestive organs.

With regard to *Treatment*, the chief point will be to limit the supply of sugar; bread, port wine, and potatoes, ale and stout, must be avoided. Give lean of meat, bran-bread, almond-cake, very pure spirit (as whisky), and light wines, as hock and claret. Another indication is to lessen the secretion of urine. This will be best assisted by opium and warm baths; friction on the skin, and astringent remedies as gallic acid, and acetate of potash, will also be found serviceable. Lactic acid ($C_3H_6O_3$), being a kind of intermediate product between grape sugar ($C_6H_{12}O_6$) and carbonic acid (CH_2O_3), is frequently given in doses of 10 grains three or four times a day.

It must, however, be stated that some authorities hold quite the opposite view, and think that plenty of sugar should be allowed, so that there may be a supply provided, and thus save the tissues.

Tests for Diabetic Urine :—

Specific gravity may be from 1025 to 1050.

(1) (Moore's test.) Equal quantities of liquor potassæ and saccharine urine, when boiled, exhibit a *deep brown coloration*, varying in tint with the amount of sugar present, and due to the formation of *melassic acid*.

(2) (Trommer's test.) Equal quantities of the urine and liquor potassæ, with the addition of just enough of a saturated solution of sulphate of copper to give the mixture a blue colour, (when boiled) precipitate the *red suboxide of copper*.

Pavy's Solution consists of caustic potash (1280 grains); neutral tartrate of potash (640 grains); and sulphate of copper (320 grains); *i.e.* in the proportions 4, 2, 1.

The suboxide of copper is precipitated of a beautiful bright red by this solution.

Fehling's Solution contains sulphate of copper ($90\frac{1}{2}$ grains); neutral tartrate of potash (364 grains); solution of caustic soda, specific gravity 1.2 (4 ounces), water being added to make up exactly 6 ounces. One grain of sugar exactly decomposes 200 grains of this solution.

(3) A few grains of the white subnitrate of bismuth are placed in a test-tube, and an equal quantity of urine and liquor potassæ are added, and the mixture boiled at the bottom. The white subnitrate is reduced to *black* metallic bismuth.

(4) Add some German yeast to the diabetic urine; raise the temperature to 80° Fahr. Effervescence occurs with discharge of gas, a yellow liquid remains, which smells like beer and yields alcohol by distillation. One part of sugar in 1000 parts of urine of the density of 1030 may be detected by this means.

It may be useful to point out the gradations of the specific gravities in the urine under different circumstances. Thus:

Hysterical urine is	.	.	1001—5
Albuminous „	.	.	1005—15
Healthy „	.	.	1015—25
Saccharine „	.	.	1025—50
			2—2

URINARY CALCULI AND CONCRETIONS.

URINARY concretions, when small and numerous, and which pass readily with the urine, constitute *sand or gravel*. When, however, they are too large to be evacuated by the urine, they constitute *calculi*. The chief chemical constituents of urinary calculi are the following, viz. :

- Uric acid and urates.
- Cystine (cystic oxide).
- Oxalate of lime.
- Carbonate of lime.
- Phosphate of lime.
- Ammonio-magnesian-phosphate.
- Proteine compounds (fibrine, mucus).

With the above are mixed very small quantities of earthy matters (silica, alumina, etc.). Sometimes the urinary concretion consists entirely of one of these substances; at others, it is composed of several of them, and not unfrequently the concretion is formed of separate layers of the different constituents.

In testing a sandy deposit, it should first be examined microscopically, then the particles should be cleared of impurities, as pus and blood, and washed with distilled water; large particles should be reduced to powder. In testing calculi, their occasional constitution in layers must be borne in mind. They should be broken to pieces, and some of the powder from each layer carefully analysed.

The best mode of proceeding analytically, is to heat some of the powdered calculus over a spirit lamp on platinum foil. Then if—

- (1) The powder is *entirely consumed*, or only a *very small amount of residue* is left, it may consist of
- Uric acid, or urate of ammonia;
 - Cystine;
 - Proteine bodies ; or,
- (2) The powder is *incombustible*, or leaves *considerable residue* after being exposed to red heat ; it may consist of
- Urates with a fixed base (soda, lime, magnesia).
 - Oxalate of lime.
 - Carbonate of lime.
 - Phosphate of lime.
 - Ammonio-magnesian-phosphate.

If, when the powder is acted upon by nitric acid and ammonia, a *distinct murexide* reaction is obtained, the concretion is formed of *urate of ammonia* or *uric acid*, and these substances are thus distinguished : uric acid is only slightly soluble in boiling water ; whilst urate of ammonia is far more readily soluble, and in much larger quantities, and, upon the cooling of the solution, it is again precipitated, and with liquor potassæ gives off ammonia.

The **uric acid calculus** is of tolerably frequent occurrence, and is sometimes of considerable size. It is usually of a yellowish, or reddish-brown colour, with a smooth surface and rather hard.

The **urate of ammonia calculus** is of rare occurrence. It is generally small, of a loamy lightish colour, and more earthy in consistence than the preceding substance.

If there be *no murexide reaction* and the concretion is *combustible*, it may consist of one of the following :

The Cystine calculus. This is rare. It is of a dull yellow colour; the surface is smooth, and exhibits a glistening crystalline appearance when broken. It is softish, and when reduced to powder communicates a soapiness to the fingers. From the larger amount of sulphur contained in it, if this calculus be dissolved in liquor potassæ and a little acetate of lead be added, the solution being then boiled, the mixture becomes *inky* from the precipitation of the black sulphide of lead.

A calculus formed of **proteine substances** (fibrine, or blood coagula) is very rare. It is amorphous in appearance; upon burning, it gives off an odour of burnt horn, it swells up on the addition of acetic acid, and is soluble in boiling nitric acid.

Urates of soda, lime, and magnesia are very seldom found as the only constituents of a calculus, but they are occasionally met with in variable quantities in calculi consisting chiefly of other substances, viz.: in the uric acid and urate of ammonia calculi. The powdered calculus is boiled with distilled water, and the solution filtered while hot; if urates are present, they will be found in the filtrate. This is evaporated, the residue being heated to redness, and if it turn moistened turmeric paper *brown*, will indicate *soda or potash*. Soda imparts a yellow, potash a violet tinge to the blowpipe flame. Magnesia and lime will be found in the residue, as carbonates; these are freely soluble in diluted acids. Upon the addition of phosphate of ammonia and soda to the solution, the ammonio-magnesian-phosphate and phosphate of lime are precipitated.

Oxalate of lime, when subjected to strong heat, turns black from the combustion of the organic matter

often present, but becomes white again after continued exposure to heat, being converted into caustic lime. If this last substance be dissolved in hydrochloric acid and oxalic acid added, oxalate of lime is precipitated, which may be recognised by its microscopic appearance. The oxalate of lime calculus is frequently met with ; it is either small, smooth, and pale in colour, or larger, with a nodular, warty surface, and of a dark-brown or black colour (the mulberry calculus). It is common in children.

A calculus composed entirely of carbonate of lime is also rare. It is of a whitish grey colour, and chalky appearance.

Carbonate of lime is generally found, in small quantity, as a component of other calculi blended with the earthy phosphates and oxalate of lime.

A concretion of carbonate of lime is infusible, and becomes black when burnt, on account of the organic matter which it often contains, but further heating renders it white. It also dissolves in hydrochloric acid *with effervescence*.

Basic phosphate of lime and ammonio-magnesian-phosphate are generally found together as constituents of urinary calculi. These calculi are usually whitish and often of considerable size. If *phosphate of lime* is in excess, they are hard and thick ; but if the *ammonio-magnesian-phosphate* predominates, they are chalky and soft. They are incombustible, and have been termed *fusible calculi*, since they fuse to a white enamel-like mass after exposure to strong heat ; they are soluble in hydrochloric acid *without effervescence*.

These two constituents are separated by adding to the calcined powder diluted hydrochloric acid, and filtering the solution ; then adding ammonia and oxalate

of ammonia, by which the lime is precipitated as an oxalate. After filtration, the phosphate of ammonia and magnesia may be obtained by the addition of ammonia in excess. Calculi of *neutral phosphate of lime* are very rare; they resemble the earthy phosphates.

The composition of urinary calculi is sometimes very complicated. Thus, some consist of uric acid, urates, and earthy phosphates; others of oxalate of lime and earthy phosphates; and, again, others have been met with, composed of six constituents, viz.: uric acid, oxalate of lime, carbonate of lime, urate of ammonia, phosphate of lime and ammonio-magnesian-phosphate. These may be all mixed together, or disposed in concentric layers.

Every calculus usually possesses a nucleus which is formed by foreign bodies, such as blood-coagula, mucus, and fibrine, or by sand particles, but sometimes there may be a cavity, instead of a nucleus, the mucus having dried up by which the nucleus was originally formed.

False, or spurious calculi usually contain much silica, which will be detected by fusion with carbonate of soda or potash.

URINARY TUBE CASTS.

These are six in number—

(1) **Granular Casts.**—These are dark and granular in appearance; are about $\frac{1}{700}$ th of an inch in diameter, and are composed of fibrine and disintegrated epithelium; they are indicative of “chronic nephritis,” especially the “intertubular” variety, and usually occur in the urine after frequent attacks of gout; they may

be found long before any other sign of renal mischief has been exhibited.

(2) **Waxy or Transparent Hyaline Casts.**—These are quite structureless, clear glassy cylinders, and vary in diameter from $\frac{1}{3000}$ th to $\frac{1}{300}$ th of an inch. They are sometimes found in the advanced stages of chronic nephritis, but also occur in acute forms of kidney disease.

(3) **Oily Casts.**—These consist of fibrine, in which are entangled oil globules, and epithelial cells gorged with oil. They indicate fatty degeneration of the kidney.

(4) **Purulent Casts.**—These exhibit pus-cells entangled in casts of fibrine, and occur in “suppurative nephritis.”

(5) **Blood or Exudative Casts.**—In these the blood is moulded in the renal tubes. They are observed in cases of strangury and hæmaturia, and acute diseases of the kidney.

(6) **Cellular or Epithelial Casts.**—These are covered by the epithelial cells of the tubuli uriniferi. They indicate that the disease is recent, and that the tubes are as yet lined by epithelium.

DISEASES OF THE KIDNEYS.

NEPHRITIS (*νέφρον*, the kidney ; itis, inflammation).

This term in its literal sense denotes an inflammation of the kidneys ; but it has nevertheless become customary to classify many diseases of these organs under this heading, although they are not all, strictly speaking, inflammatory. Diseases of the kidney are primarily divided into—

- (1) ATTENDED BY DROPSY AND ALBUMINOUS URINE (BRIGHT'S DISEASE).
- (2) UNATTENDED BY DROPSY AND ALBUMINOUS URINE (PYELITIS).

BRIGHT'S DISEASE.

The diseases included under this name are divided into Acute and Chronic.

ACUTE BRIGHT'S DISEASE

has also received the names of

ACUTE DESQUAMATIVE NEPHRITIS,
and

ACUTE TUBAL OR TUBULAR NEPHRITIS.

CHRONIC BRIGHT'S DISEASE.

Under this heading are included the following, viz. :—

- (1) { CHRONIC DESQUAMATIVE NEPHRITIS ;
CHRONIC TUBULAR NEPHRITIS ; or
LARGE WHITE KIDNEY.
- (2) FATTY KIDNEY.

(3) LARDACEOUS, WAXY, AMYLOID, OR ALBUMINOID KIDNEY.

(4) $\left\{ \begin{array}{l} \text{INTERTUBULAR NEPHRITIS.} \\ \text{GRANULAR} \\ \text{CONTRACTED} \\ \text{GOUTY} \\ \text{CIRRHOTIC} \\ \text{ATROPHIED} \\ \text{FIBRINOUS} \end{array} \right\} \text{ KIDNEY.}$

Other forms of renal disease are also recognised under the names of

$\left. \begin{array}{l} \text{CANCEROUS,} \\ \text{TUBERCULAR,} \\ \text{and} \\ \text{SYPHILITIC} \end{array} \right\} \text{ KIDNEY,}$

but these can only be of importance as a part of a general cachexia.

ACUTE BRIGHT'S DISEASE.

Definition.—An inflammation of the mucous membrane lining the tubuli uriniferi.

Causes.—Cold and wet, intemperance, scarlatina, and cholera poison.

Symptoms.—There may be obscure fever symptoms, rigors and chilliness, thirst, dry skin, quick pulse, nausea and vomiting, with pain in the back, usually referred to one side. Micturition is difficult. The urine is scanty, high-coloured and smoky, of high specific gravity and albuminous, sometimes bloody (indicating that the disease is recent). The limbs, head, and face swell, and there is puffiness under the eyelids.

Complications.—Inflammation of any serous membrane, pneumonia and bronchitis.

Terminations.—Not necessarily fatal or followed by chronic Bright's disease. In consequence of the inflammation of the mucous membrane of the tubuli, the scales of epithelium are thrown off in such numbers that the tubuli are blocked up, the urea and uric acid are retained in the blood, and the albumen and blood corpuscles pass into the urine. Death may result from dropsy, or from some complication, as pleurisy, pneumonia, or pericarditis.

Pathology.—The kidneys are increased in volume and weight, even to twice their normal size. The surface is smooth, and the capsule readily removable. In early stages the kidney on section is dripping with blood, from which circumstance Dickinson calls it the chocolate blood-dripping kidney. The renal substance is sometimes everywhere engorged with blood, but occasionally the cortical portions are everywhere anæmic. There is no alteration of the intertubular stroma. Red points are generally observed upon the surface, and within the cortical portions, being due to minute ecchymoses. A wheat-sheaf appearance is sometimes presented, owing to the cones being deeply congested, and the tubes separated at their bases by swollen cortical substance. The kidneys offer considerable resistance to pressure. In later stages they are mottled white and red. The normal weight of each kidney being 3 to 5 ounces, in this disease, one kidney may attain to, or even exceed, 8 ounces, and microscopically there is an enormous increase of the epithelial cells of the tubuli uriniferi, which being choked up, constrict the capillaries. If recovery does not take place at this period it is stated that the condition of the large white kidney may be established.

Treatment.—Warm baths, hot air bath; and to

promote perspiration and to relieve the tubes of their load, plenty of water to drink, citrate of potash, acetate of potash, infusion of digitalis, a diet of beef-tea, milk, and soup. Leeches and dry cupping, and hot linseed meal poultices are sometimes of service. If there be much pain in the back, a belladonna plaister may be useful. Dover's powder, pulvis jalapæ compositus, gamboge, and elaterium are sometimes demanded. When convalescence sets in, cold must be carefully guarded against and iron preparations exhibited.

CHRONIC TUBULAR NEPHRITIS.

This may follow the acute form, but it is a far more serious condition, since in addition to desquamation of the tubes there are organic changes in the kidney itself.

Symptoms.—These are at first exceedingly insidious. The disease creeps on until it assumes a very serious character, and when fully established it usually denotes a breaking up of the whole system. There is puffiness of the face (especially marked under the eyelids), general anæmia, the urine is loaded with albumen; specific gravity is sometimes normal, sometimes low or rather high, containing casts, fatty, hyaline, or epithelial. Dropsy is a very common symptom.

Complications.—These are usually dyspepsia, vomiting in the early morning, bronchitis, hydrothorax, hydropericardium, diarrhoea, and hepatic cirrhosis.

Terminations.—In consequence of the urea being retained in the blood, uræmic poisoning is induced, and the patient may die of coma, or the induction of an epileptic condition. The affection usually occurs about 28 years of age, exceptionally may last for years, but generally runs its course in 6 months.

Pathology.—The kidney is much increased in size ; the capsule peels readily. The cortical portion is increased in volume, the surface is smooth and white, with blue arborescent veins, or of a pale yellow colour, and marked with striations. The pyramids are frequently congested, and the renal tubes under the microscope appear dilated and distended with cells, and with fatty and granular materials. The intertubular stroma is unaltered.

Treatment.—Hydragogue cathartics, pulvis jalapæ compositus, colocynth, diaphoretics, hot water and vapour baths. For keeping up the general health, the most valuable drug is *Iron*. Diuretics, mercury, cupping, and bleeding must, in most cases, be avoided.

FATTY KIDNEY.

In this condition the kidney substance is replaced by fat. The incised organ feels greasy, is of a pale fawn-colour, and yields to pressure. It is more or less enlarged, and oil drops, or globules of fat, are observed in great excess in the epithelium of the convoluted tubes. The weight of one kidney may reach, or even exceed, 14 ounces.

This condition can only be determined accurately after death, but if numerous oil-casts are found in clear pale albuminous urine, of low specific gravity, the disease may be suspected. The chief cause is spirit-drinking, but it may occur in cases of phthisis, and in connexion with fatty disease of other organs.

Treatment can only be palliative.

LARDACEOUS OR AMYLOID KIDNEY.

In this condition the kidney substance is infiltrated, or replaced by the amyloid material, so called by

Virchow from its supposed analogy to starch (*amylum*). The size of the organ may or may not be increased; the cut surfaces are smooth, of the consistency of raw bacon (*lardum*), and translucent like wax. In extreme cases the organ appears as if it were soaked in balsam or glycerine, which had hardened the tissues. The morbid material is first deposited in and around the walls of the vessels, and afterwards it involves the surrounding tissues. Both kidneys are usually affected in about an equal degree.

As in the case of the fatty kidney this lardaceous condition can only be absolutely determined after death. Dropsy is a prominent symptom only in advanced stages; 100 or 200 ounces of very albuminous urine may be passed daily. This is of low specific gravity, containing only a few casts, which are generally hyaline or waxy; but if these symptoms occur in a patient suffering from diarrhoea, carious bones, phthisis, enlarged liver or spleen, or who has had syphilis, or is suffering from a drainage of pus, the existence of this disease may be suspected.

Treatment is, of course, unsatisfactory, but with extreme dropsy punctures may be made into the skin or scrotum. To avoid erysipelas, lint soaked in boracic acid, may be wrapped round the needle before piercing; milk may be given *ad libitum*; no spirits, but claret or beer may be taken. The strength should be supported by tonics, especially iron preparations; gamboge and elaterium are useful. Diaphoresis may be induced by injections of pilocarpin.

INTERTUBULAR NEPHRITIS.

Definition.—A fibroid hypertrophy of the intertubular connective tissue of the kidney.

Symptoms.—The urine is increased in quantity, of low specific gravity, and albuminous, and micturition is frequent. The tube-casts are large, granular, and waxy. The patient is pallid, subject to dyspepsia, dyspnœa, giddiness, palpitation, and œdema of the legs; but dropsy is not so common as in the chronic tubular nephritis. The skin is harsh and dry, flesh and strength are gradually lost, and vomiting is sometimes very troublesome. This disease is very insidious, creeping along for months or years, is slower in its progress than all other forms of kidney disease, and is chiefly observed in middle-aged (fifty) and gouty persons, it is twice as frequent in males as in females. Very early in the disease the urine may be free from albumen, or contain a very small quantity, but it is increased in quantity and contains tube casts, which are granular or hyaline; later on the urine becomes scanty and the albumen copious. Death may result from asthenia, lung disease, uræmia, or other complications.

Complications.—These are a peculiar form of retinitis (retinitis albuminurica), paralysis, bronchitis, dropsy, hepatic cirrhosis, and cardiac hypertrophy. This change in the heart's structure is said by some writers to be due to increased tension in the arterial system, whilst others maintain that it is due to a general arterio-capillary fibrosis, or fibrous thickening of the small vessels throughout the whole arterial system, inducing thickening of the vascular walls, loss of elasticity, and wasting of the tissues.

Pathology.—The whole organ is much reduced in size.

The capsule is thickened and firmly adherent ; when an attempt is made to peel it off, small portions of its tissue adhere to the surface of the gland. On section the cortical portion is found much reduced in size and thickness, the whole structure being coarse and fibrous.

Microscopically the connective tissue is very vascular, and infiltrated with cells which subsequently become fusiform, and are converted into fibrous tissue. The newly-formed tissue produces pressure upon the adjoining parts, and hence appear atrophy of the Malpighian bodies and shrinking of the renal tubes, which are often devoid of epithelium ; sometimes numerous cysts are found. Some pathologists incline to the opinion that the granular kidney is only a modification of the large white variety.

Treatment.—Very unsatisfactory, and must be directed to keeping up the general health.

PYELITIS (πύελον, the pelvis ; itis).

Definition.—An inflammation of the pelvis, infundibula and calices of the kidney.

This disease is unattended by dropsy and albuminous urine, and is, therefore, not classified under the name of Bright's disease. It may be conveniently divided into Acute and Chronic forms.

Causes.—Cold and exposure. The irritation set up by gravel or calculus in the kidney. The upward extension of gonorrhœal inflammation of the bladder or urethra, accumulation and decomposition of urine in the pelvis. Tubercular deposits in the mucous membrane.

ACUTE PYELITIS.

Symptoms.—These are rigors, followed by pyrexia and vomiting ; pain in the back, on one side, increased

on pressure or movement; pain shooting down from the kidney in the direction of the ureter, and extending in the male to the tip of the penis, and often attended by retraction of the testicle of the affected side. The urine is high-coloured and scanty, and its passage is attended by scalding.

If the disease prove fatal, which is rare, the lining membrane of the affected part will be found red and swollen.

Treatment.—Leeches to the affected part, hot linseed meal poultices, warm fomentations, diluent and mucilaginous drinks, warm baths, and if there be a deposit of uric acid in the urine the appropriate treatment of this diathesis; opium or hyoscyamus is of great service in alleviating the pain which is always present.

CHRONIC PYELITIS.

In this condition there is dull, aching pain in the lumbar region, increased by movement, especially riding. There is general debility; pus, blood, and albumen are almost invariably present in the urine, and accompanied by urinary deposits of various kinds.

Dilatation of the kidney may occur, giving rise to the condition known as **Hydronephrosis**, when the dilating agent is watery fluid, or to **Pyonephrosis** if pus be present. The symptoms of renal dilatation are a fulness or a smooth fixed tumour to be felt in the lumbar region, with tenderness on pressure, the size of the swelling being dependent upon the amount of fluid present.

If the urine is acid, and there is no disease of the prostate, bladder, or urethra, the presence of pus and blood in this fluid is strongly indicative of pyelitis.

An abscess may burst into the pelvis of the kidney

and be discharged by the urethra, or may point into the loins or groin. It is always accompanied by symptoms of hectic fever.

Pathology.—There is redness of the lining membrane, which is thickened, ulcerated, or covered by muco-purulent secretion, and there are calculi in the pelvis of the kidney.

When suppuration (suppurative nephritis) has taken place, the kidneys are enlarged and congested, and scattered abscesses are observed varying from the size of a walnut to that of a hemp-seed. The tubes are crammed with pus-corpuscles and epithelial cells. If the suppuration has resulted from a calculus, the kidney substance will be found destroyed, and its external portions converted into the sac of an abscess which occupies its interior.

Treatment.—Hot hip baths, vapour or air baths, fomentations, diaphoretics, Dover's powder, tea, milk, ice, simple diluents, a free amount of aqueous drinks; a belladonna plaster to the seat of pain. To check hæmorrhage, gallic acid, tinctura ferri perchloridi, and the lead and opium pill may be given.

To relieve the pain during the passage of a calculus down the ureter, warm baths, chloroform or ether inhalation may be exhibited in combination with full doses of opium and spiritus ætheris nitrosi; the diet consisting of barley-water.

To obviate the formation of future calculus:

In the *uric acid* diathesis the appropriate remedies are bicarbonate of potash, liquor potassæ, citrate of potash in full doses; avoidance of wine and beer.

In the *phosphatic* diathesis, animal food, wine, and diluted spirits, bark, quinine, phosphoric acid, nitrohydrochloric acid, and opium are the indications.

In *oxaluria*, avoid garden rhubarb, sorrel, salad, and sugar ; give diluted nitric acid, diluted hydrochloric acid, and attend to the digestive organs.

Nephritic Colic is the term applied to the passage of a calculus from the pelvis of the kidney down the ureter to the bladder.

Most agonising pain is caused, with symptoms of general pyrexia. Pressure over the part affords relief, and the pain instantly ceases when the stone passes into the bladder. The treatment consists in hot-baths, hot fomentations, and the internal administration of opiates.

MORBUS ADDISONI. MELASMA ADDISONI. ADDISON'S DISEASE.

Symptoms.—This disease really consists in a peculiar form of anæmia, with progressive emaciation. The skin exhibits patches, upon various parts of the body, of an olive-green or brownish-red colour, especially marked upon the flexures of the body, or upon those parts which are naturally darker than the rest, as the scrotum, umbilicus and axilla. The neck, face, and upper extremities are generally bronzed, and dark stains are sometimes observed on the lips and inner side of the cheeks. The pulse is very feeble and the lips pallid. There is breathlessness upon the least exertion, with palpitation and extreme debility. The duration is about one to two years on an average.

Pathology.—The exact nature of this disease is not as yet clearly understood, but it appears to be associated with some peculiar changes in the supra-renal capsules. It would seem that in its pathology it is closely allied to the tuberculous process ; for, accord-

ing to Wilks, we find that there is "first the deposition of a translucent, softish, homogeneous substance ; subsequently the degeneration of this into a yellowish-white opaque matter ; and afterwards softening into a so-called abscess, or drying up into a chalky mass."

Treatment.—This must be directed to keeping up the general health, by means of tonics and nourishing food, wine, and cod-liver oil ; but it must be admitted that no remedial measures have as yet proved of much service.

DISEASES OF THE PANCREAS.

Diseases of this gland are comparatively rare, and their diagnosis is almost impossible.

The affections to which the pancreas is liable are the following :

Congestion, hypertrophy, atrophy, induration, softening, inflammation (acute and chronic), suppuration, fatty degeneration, hydatid tumours, and cancer (both of the soft and hard variety) ; calculous formation (chiefly phosphate of lime) may also be found in the pancreatic duct and its branches.

There are generally enlargement and tenderness of the gland, with fulness, hardness, and deep-seated pain in the epigastrium, vomiting, salivation, anorexia, odourless eructations, and occasional diarrhœa, debility, depression, and emaciation. The presence of fat in the stools is by some considered diagnostic. If a pancreatic tumour presses upon the ductus communis choledochus, it may give rise to jaundice.

Treatment.—Relieve the symptoms by nutrient enemata, repeated small blisters, ice, etc.

DISEASES OF THE SPLEEN.

This organ may be the seat of acute and chronic inflammation, and of various structural affections, as abscess, gangrene, hypertrophy, hydatid and serous cysts, and fibrinous deposits, which are probably the remains of extravasated blood; tubercular deposits, and fatty and lardaceous changes may also occur. Diseases of the spleen are more frequent among the residents in tropical and marshy districts than in temperate climates. The "Ague cake," or simple enlargement of the organ is usually the result of intermittent fever, and occurs in a small proportion of cases in cirrhosis of the liver. Notable enlargement occurs in leucocythemia, whilst more or less enlargement has been observed in typhoid fever. The normal weight of the spleen is about 6 ounces, its length 6 inches, and its breadth 3 inches.

The diagnosis of splenic diseases is confessedly difficult, but if splenitis, or inflammation of the spleen occurs and is followed by abscess, there have been observed pain in the epigastrium and left hypochondrium, with tenderness on pressure, more or less febrile excitement, with thirst, loss of appetite, vomiting or nausea, and the appearance of abscess under the integument, or the discharge of pus by stool, expectoration, or vomiting. According to Dr. Flint, in some cases of splenic enlargement, "the enlarged organ extends upwards, pushing up the diaphragm and causing an evident projection of the false ribs of the left side of the chest. Its upper border is accurately indicated by the line of demarcation between pulmonary resonance and dulness on percussion, and the lower

border is determined, approximately, by finding the upper limits of tympanitic resonance. In other cases, the organ is dragged downward by its weight, and may descend as low as the brim of the pelvis. Under these circumstances, if the abdominal walls be thin and relaxed, the organ may be grasped by the hand and restored to its normal position. The form will serve to distinguish it from the other abdominal tumours. The hilus may sometimes be felt through the abdominal walls."

Treatment.—If ague be the cause, quinine, bark, and arsenical preparations with aperients, may be employed. If there be other causes, the salts of iron, bromide of potassium, good nourishment, and a dry, bracing locality, are the appropriate remedies. Depletion and mercury must be avoided.

DISEASES OF THE MOUTH.

STOMATITIS.

Definition.—Inflammation of the mouth.

Varieties.—(1) Simple or Catarrhal; (2) Follicular; (3) Aphthous; (4) Parasitic; (5) Gangrenous, or Cancrum Oris.

SIMPLE OR CATARRHAL STOMATITIS

Commences with red bright patches on the interior of the cheeks, spreading with a considerable amount of swelling until it may involve the entire surface. It is usually accompanied by an unpleasant taste, loss of appetite, and dirty tongue.

FOLLICULAR STOMATITIS.

In this form the mucous follicles become enlarged and obstructed, and they usually soften and break, leaving small ulcers and some redness.

APHTHOUS STOMATITIS.

This is generally seen in infants, in whom it presents whitish yellow spots on the palate, cheek, and lips. It is usually preceded by restlessness, feverishness, and symptoms of gastro-intestinal disturbance.

PARASITIC STOMATITIS.—APHTHÆ OR THRUSH.

This is said to be dependent upon the presence of a vegetable parasite, the *Oidium Albicans*. The symptoms are pain and heat in the mouth, in which are seen greyish white patches resembling curdled milk, and which are removed with ease. It is commonly observed in children.

GANGRENOUS STOMATITIS.—CANCERUM ORIS.

This is a very terrible affection, although happily rare. Delicate children are very liable to it, especially when convalescent from measles or some acute disease. It commences as an ulcer on the mucous membrane of the cheek or lip, extending to the deeper tissues, penetrating the skin, and producing destruction of the face, an unsightly excavation being left, of which the edges are ragged and gangrenous. Tenderness and pain may be very slight and even absent. The cheek swells, the breath is intensely offensive, there is great dribbling of saliva, the prostration is very extreme and rapid in progress, and a fatal result soon follows.

Treatment.

In all the above affections the most important remedy is chlorate of potash. It may be given to children in doses of 2 to 5 grains, but in adults from 10 to 30 grains. In thrush, borax and honey may be applied locally. But remedies to counteract gastric irritation must never be omitted, viz., soda and rhubarb and grey powder. The mouth should be washed out with some antiseptic solution, as of carbolic acid or permanganate of potash. In cancrum oris all that can be done is to place the child under chloroform and burn the part with strong nitric acid.

PAROTITIS.—MUMPS.

This is an affection of the parotid glands and the other salivary glands. The parotid is especially very painful to the touch and extremely swollen. There is slight fever, and difficulty in opening the mouth and in deglutition. The duration of the affection is about four or five days, and recovery always results. Sometimes during the decline the mammæ in the female or the testicles in the male may be swollen; in the latter case occasionally atrophy of the testicle ensues.

Treatment.—A flannel bandage or a linseed meal poultice may be applied to the painful part. A saline mixture may be given internally, and during convalescence nourishing food and tonics are indicated.

DISEASES OF THE ŒSOPHAGUS.

ŒSOPHAGITIS.

Definition.—Inflammation of the œsophagus.

Symptoms.—There is pain or sense of burning, during the act of swallowing, through the whole length of the tube, or in a certain part. The pain is sometimes increased when the larynx is pressed firmly against the spine. If the inflammation extends to the mucous membrane of the stomach, there is pain in the epigastrium, accompanied by vomiting, which in some cases leads to the expulsion of tenacious casts of the œsophagus. Large flakes of epithelium are frequently discharged in cases of œsophagitis produced by swallowing hot water or corrosive poisons.

Causes.—Irritant and stimulant applications, as hot water, and several corrosive poisons; extension of inflammation from the mouth, fauces, or tonsils; wounds. It may be a complication of pyæmia, cholera, or the specific fevers.

Treatment.—A farinaceous liquid diet, and the frequent use of ice and iced water. Nutritious injections must be employed when the difficulty of swallowing is very great. After the first or second week a bougie may be passed daily to obviate contraction during cicatrisation.

OTHER DISEASES OF THE ŒSOPHAGUS.

The œsophagus may be the seat of *functional* diseases, as rheumatism, and spasmodic stricture; or of *structural* diseases, as hypertrophy of the submucous

tissue, and malignant degenerations, as scirrhus and epithelioma. It may be subject to pressure from an aneurism of the carotid artery or of the aorta, from enlargement of the cervical glands, and from diseases of the spinal column.

Rheumatism of the Œsophagus is rare, but it is distinguished by painful deglutition, referred distinctly to some part of the course of this tube, accompanied by rheumatism of other muscles, and yielding to the appropriate treatment of muscular rheumatism.

Spasmodic Stricture of the Œsophagus is characterised by dysphagia, a sense of choking in the throat, the food either passing into the stomach after several attempts to swallow, or being rejected. It is usually associated with hysteria, and readily yields to the treatment of that affection. It is distinguished from organic stricture by its intermittent character; by examination with the bougie, and by the history of the case. No local treatment is required, but in obstinate cases the bougie passed occasionally may confer benefit.

DISEASES OF THE STOMACH.

CONGESTION.

Symptoms.—The natural secretion of the stomach (the gastric juice), is diminished; anorexia, more or less constipation and dyspepsia therefore result. The tongue is generally dry, and thirst is a common symptom. Hæmatemesis sometimes occurs, and “coffee ground” vomiting may take place, and even melæna. There is usually some tenderness or pain in the epigastrium.

Causes.—Obstruction to the blood-flow through the liver and thoracic viscera, cirrhosis of the liver, long continued obliteration of the biliary ducts, cancerous tumours pressing upon the portal vein ; acute biliary suppression occurring in relapsing and yellow fevers, emphysema of the lungs, and mitral disease of the heart.

Functional derangement of the stomach may induce congestion, and the organ may assume a vicarious office when the menstrual function fails to be performed, a monthly hæmatemesis occurring.

Pathology.—The gastric mucous membrane is of a deep red or purple colour, thickened and covered by tenacious mucus. The vessels are enlarged and filled with blood, the rugæ are very prominent ; dark-coloured small round spots are observed chiefly at the pylorus.

Microscopically, the vessels are intensely congested, and the coats of the veins are thickened.

Treatment.—This must be directed to the removal of the cause. Free watery purgation by tartrate of soda, or some other mild saline, is desirable.

The abdominal circulation should be relieved by copious diuresis with the acetate or nitrate of potash. Irritating food and medicines, and strong alcoholic drinks must be avoided ; but eggs, milk, and farinaceous food should be administered.

GASTRITIS.

Inflammation of the stomach may occur under three forms, viz. :—Acute, Subacute, and Chronic.

ACUTE GASTRITIS.

Definition.—Acute inflammation of the stomach.

Causes.—The disease is seldom, or never, *idiopathic*, but is usually the result of mechanical, chemical, or toxic irritants. Thus, the sword swallowed by the juggler, or powdered glass, may be sources of *mechanical* irritation; whilst the mineral acids, corrosive sublimate, and the caustic alkalies, act *chemically*; as *toxic* irritants may be mentioned belladonna, tobacco, savin, cantharides, and arsenic.

Symptoms.—These will vary according to the particular cause, but will include acute fixed pain, with burning heat at the pit of the stomach, increased by respiration, by pressure, or by the act of swallowing; nausea, with constant and violent retching and vomiting of clear viscid mucus sometimes streaked with blood; the pulse is small and rapid, thirst is intense, the bowels are confined, and there is extreme anxiety and great restlessness.

It is a rare event that the lesion is limited to the stomach, the gullet and the intestines being generally involved; there is pain and difficulty in swallowing, excessive tenderness over the abdomen, and diarrhoea. Extreme prostration and death may ensue from exhaustion.

Terminations.—(1) In resolution; (2) In chronic gastritis; (3) In gangrene; (4) In ulceration, followed by perforation.

Pathology.—There is unusual and universal redness of the gastric mucous membrane, which is covered by inflammatory patches, especially around the pylorus and cardia. The rugæ are deep red, and numerous brown or soot-black spots, varying in size from a pin's

head to a pea, termed "*hæmorrhagic erosions*" are observed, or the membrane may be softened, ulcerated, or even gangrenous.

Treatment.—This must depend upon the cause, but it may be stated generally thus: Give the stomach all the rest possible. Allay thirst by giving small pieces of ice to suck, or iced water in small quantities at a time. Opiates are of the greatest value. The salts of morphia may be placed upon the tongue, sprinkled upon a vesicated surface, applied hypodermically, or given in the form of an enema.

Milk and lime-water, and mucilaginous drinks should be given in small quantities, at short intervals, together with cream and raw eggs. In cases of poisoning by acids or corrosive poisons, the appropriate remedies for each particular poison must be exhibited. Thus :—

For *Arsenical Preparations* the reputed antidote is the hydrated peroxide of iron.

For *Corrosive Sublimate* and other salts of mercury, and for the salts of *Copper*, the antidote is albumen.

For *Tartar Emetic*, any substances containing tannin.

For *Nitrate of Silver*, common salt.

For the *Mineral Acids*, magnesia or chalk, alkaline carbonates and soap.

For *Oxalic Acid*, magnesia and chalk; plaster from an apartment. *No alkalies*, since these form compounds quite as poisonous as oxalic acid.

For *Ammonia*, *Potash*, or *Soda*, vinegar, or the diluted vegetable acids.

SUBACUTE GASTRITIS.

Subacute inflammation of the stomach occurs in certain cases which are connected with dyspepsia. It

is much more common in young children and infants than at later periods of life. Anything which in the adult might occasion an attack of transient dyspepsia may set up subacute inflammation of the stomach in the child. It must, however, be remembered that imtemperate habits will produce subacute gastritis in the adult. The degree of inflammation varies in different cases, being slight, moderate, or considerable. There may be more or less congestion of the mucous membrane. There is a morbid increase of mucus, and the contents of the stomach may consequently have an alkaline reaction.

Symptoms.—When the inflammation is slight or moderate the appetite is either impaired or lost. The reception of food is followed by dyspeptic symptoms, as uneasiness and tenderness in the epigastrium, eructations and flatulence; the tongue is furred; the urine is high coloured, and loaded with lithates.

Constipation, or diarrhoea, may be present. Pain in the head, accompanied by nausea, is a frequent symptom, and there is great depression of spirits.

Should the inflammation be of considerable intensity, there is severe pain in the epigastrium; complete anorexia, with nausea and loathing of food. Vomiting is a frequent symptom, and mucus is voided in abundance. Thirst is intense, with craving for cold drinks. Rigors are not uncommon, and headache is well marked. There is often much prostration. In cases of maximum severity the approximation is so close to acute gastritis that there is scarcely a well marked line of division between the two forms. When the inflammation is slight, convalescence may take place in a few days. When rather intense, the disease may be protracted to a week or three weeks, but if

the inflammation extend beyond this time, it is to be regarded as chronic.

Causes.—In some cases this affection is dietetic in its origin, arising from the decomposition of the ingesta, either from deficiency of the gastric juice, or from the quantity of food taken being disproportionate to the digestive capacity of the stomach. Over indulgence in eating, the free use of condiments, or a prolonged debauch are frequent causes. The habitual free use of ardent spirits induces a liability to it, since it is especially observed among drunkards, or it may be produced by any of the irritant or acrid poisons which have not been taken in sufficient quantity to set up acute gastritis.

Treatment.—Rest is of the first importance; in mild cases, a diet reduced in quantity, and consisting of lime water and milk with farinaceous substances. In more severe cases, complete abstinence from food for two or three days. In cases of exhaustion, nutrient enemata may be given. Sinapisms or blisters over the epigastrium often afford relief, and when constipation is present simple enemata are indicated. To soothe the inflamed membrane and to allay vomiting, hydrocyanic acid, hyoscyamus, and the salts of bismuth and morphia are indicated. Sucking small pieces of ice and iced water often afford much relief. The bi-carbonate of soda may be given in carbonated water. As soon as food is tolerated the diet should be gradual and tentative. The spirit drinker should be warned of the connexion of his habits with his disease.

Pathology.—The stomach is contracted and small. The chief appearances under the microscope are those of congestion; the vessels are injected. The gastric

tubes are filled with cells, fatty and granular matters, and sometimes with blood.

CHRONIC GASTRITIS.

Symptoms.—A burning sensation, or feeling of heat in the gastric region, with tenderness over the epigastrium, which is constant, *i.e.*, not present only during digestion. There is habitual thirst; stimulating articles of diet, and strong alcoholic drinks are not well borne. Nausea and vomiting are common. In making the diagnosis, chronic dyspepsia, and such structural affections of the stomach as ulcer and cancer must be excluded.

Causes.—Chronic gastritis may follow the inflammation induced by corrosive and acrid poisons, or from long-continued indulgence in spirit-drinking, or from long fasting, or too rigid dieting. Arsenic introduced into the stomach by absorption from an external wound may produce this condition. Other causes are venous congestion resulting from diseases of the liver, as cirrhosis, by which obstruction is occasioned; diseases of the heart; and renal disease, involving uræmia.

Pathology.—The whole stomach is globular and much thickened, especially at the pylorus, the walls not collapsing on section. If the inflammation is limited to the mucous membrane, this membrane is of a dark or slate-grey colour, the surface being uneven and warty, *i. e.*, *mammillated* and dense.

Under the microscope, at early periods the gastric tubes are observed to be firmly bound together, the blood-vessels being thickened and enlarged. At later periods fibrous tissue replaces the tubes, and atrophy

of the gastric tubes may be produced by the presence of the newly-formed fibres.

Treatment.—Remove the dietetic causes. A bland easily digested diet, such as eggs, milk, stale bread, and soft boiled rice. No meat or stimulants. Food should be taken in small quantities, and at short intervals. Remedies to soothe the inflamed membrane, viz. : small doses of the salts of morphia and bismuth, hydrocyanic acid, and hyoscyamus. After the cessation of inflammation, tonics and improved diet.

ULCERATION OF THE STOMACH.

This affection occurs under four well-marked forms:

(1.) **Superficial Erosions** consequent upon the dark round spots which are frequently observed in congestion and sub-acute gastritis.

(2.) **Perforating Ulcers.**—These are circular in shape, and penetrate the coats of the organ, the edges being sharp, as if punched out.

(3.) **Chronic Gastric Ulcers.**—In these the edges are usually elevated, and the structures around them are dense and hard, their surfaces being formed by the unperforated coats, or by some other organ, as the liver, to which adhesions have extended. They are most common at the pylorus.

(4.) **Sloughing Ulcers.**—These are occasionally found in persons who have previously shown no signs of gastric disease, but are much reduced by diseases of the kidneys or by syphilis.

Symptoms.—The diagnosis of ulceration of the stomach is often very uncertain and difficult, but the general symptoms are the following : There is pain at the pit of the stomach of a gnawing or burning

character, and limited to a circumscribed space, coming on immediately or soon after the reception of food (especially certain kinds of food, such as hot drinks and alcoholic liquids) continuing for an hour or more, and being relieved as the stomach becomes empty. Nausea, with vomiting of some liquid or of blood, is frequently observed. There is emaciation, and the aspect is unhealthy and expressive of suffering. In most cases the constitutional disturbance is only slight, and the first indication of disease may be hæmatemesis or even perforation of the stomach; occasionally the ulcer remains open for many years, eventually leading to perforation, but in other cases the ulcerative process is very rapid, perforation taking place within a few weeks from the formation of the ulcer. The ulcer is chiefly seated on the posterior wall of the stomach. When it is seated on the anterior wall, there is greater liability to perforation.

Causes.—The female sex are far more prone to this disease than the male. The simple perforating ulcer is generally found in the class of maid servants, between the ages of 18 and 25. The exciting causes are very obscure.

Terminations.—In recovery. In hæmorrhage followed by prolonged collapse or by fatal syncope; in death by perforation; in marasmus from constant vomiting.

About one in five cases will probably prove fatal by one of these modes.

Pathology.—The simple perforating ulcer is rarely smaller than a fourpenny piece or larger than a five-shilling piece. In shape it is generally oval or round, and presents the appearance of a shallow level pit, with a sharp, smooth, vertical edge, as if punched out.

The ulcerated space is largest in the mucous membrane, next in the muscular tissue, the shape being that of a funnel or cone ; and, if it pass through the peritoneum, the perforation then becomes a mere chink or pin-hole. The areolar tissue and mucous membrane are at times thickened by exudation of lymph, and the surrounding mucous membrane is occasionally inflamed. Perforation occurs in about one case in eight, the fatal result being often averted by adhesion of the bases of the ulcers to the liver, spleen, pancreas, mesentery, or diaphragm.

It must be borne in mind that under certain circumstances the coats of the stomach undergo *self-digestion*; in this case the mucous membrane may be partially or wholly dissolved by the gastric juice, pulpy or gelatinous softening results, ragged ulcers are formed, and finally ulceration takes place. The mucous membrane itself is thin, smooth, and more translucent than in the normal condition ; when it is entirely dissolved, the muscular coat is left bare, and its veins are gorged with black blood. A ragged aperture may at last be formed by the removal of all the coats of the organ, and the contents of the stomach will then pass into the peritoneum.

Self-digestion of the stomach is observed in persons who have died suddenly during the process of digestion, or in those who have died from phthisis or brain diseases.

Treatment of Gastric Ulcer.—A strictly regulated diet ; the complete exclusion of solid food, bland farinaceous substances with milk being employed. Nourishment should be given in small quantities at a time and at short intervals. Spirituous liquors and hot fluids must be avoided. *Tenderness on pressure* may

be alleviated by blisters or mustard poultices, and *constant pain* may be relieved by the preparations of opium or morphia; *pyrosis* will be best treated by the salts of bismuth, and for *distressing vomiting* diluted hydrocyanic acid will be found of great service. If *constipation* be present, castor oil is very beneficial, and *diarrhœa* may be checked by the pulvis kino compositus.

CANCER OF THE STOMACH.

This affection is very rare under thirty years of age.

The stomach may be the seat of various forms of cancer—namely, scirrhus or hard; medullary or soft; and colloid or gelatiniform. The most frequent seat of scirrhus is at the pylorus, at which it forms a hard cartilaginous tumour surrounding and occluding the duodenal aperture. At the cardia the cancer is always of the medullary variety, and here it forms a soft, vascular tumour. Colloid cancer is found in large jelly-like masses.

When the pylorus is affected, the stomach is much expanded and hypertrophied; the vomited matters are fermented and frothy, containing *sarcinæ*, and the pain comes on some time after the reception of food. When the cardia is the seat of disease, the organ is much contracted. The vomited matters contain altered blood, causing the so-called coffee-ground vomit. The pain is of a stabbing character, and occurs immediately after the reception of food. Cancerous elements may be found in the vomit in either variety.

Symptoms.—In the early stages the symptoms are very obscure; they are generally those of dyspepsia.

The patient becomes emaciated, and no relief is

afforded to the dyspepsia. The pain becomes of a gnawing, burning, or stabbing nature; there are fetid acid eructations. The ingesta are vomited, together with blood, mucus, or dark grumous or frothy matter. There is constipation, with retraction of the belly, which becomes flat and hard. The cancerous cachexia is observed in the colour and expression of the countenance. When the pylorus is affected (and this is most commonly the case), the passage of food into the intestine is arrested; it therefore accumulates and undergoes fermentation in the stomach, and produces distressing distension, which is occasionally relieved by copious vomiting. When the cancer is of the scirrhus variety a tumour, uneven, hard, and immovable, may be discovered, an inch or two below the liver to the right side, but it may in some cases be dragged to the left side.

Treatment.—This must be nourishing and palliative, consisting of new milk, or milk thickened with arrowroot, strong soups, jellies, or tripe boiled in milk; food should be taken frequently and in small quantities; nutritive enemata may be given, and cod-liver oil may be rubbed into the abdomen. If the pylorus is affected, remedies to arrest fermentation must be exhibited. In this case animal food is more suitable; stimulants are frequently necessary, and of these champagne and effervescing drinks are the best.

Narcotics and sedatives, especially hypodermic injections of morphia, are the chief indications, and anodyne plasters and fomentations may afford relief.

DYSPEPSIA (δύς, with difficulty ; πέπω, to digest).

The train of symptoms included under the name of dyspepsia are frequently expressive of serious organic disease of the stomach, but they may also be occasioned by mere functional disturbance of that organ, and thus dyspepsia in most cases is only a functional disease. This affection may be divided into acute and chronic forms.

ACUTE DYSPEPSIA.

This term is applied to disorder of the digestive organs, accompanied by comparatively violent symptoms and lasting only for a short period. It is commonly known as a *bilious attack* or a *fit of indigestion*. It is a condition arising from the ingestion of indigestible diet, over-repletion of the stomach, or by the digestive functions being arrested by fatigue, strong emotions, and other causes.

In some cases the symptoms are a sensation of fullness, weight, or pain in the epigastrium, with nausea and vomiting, followed by diarrhœa. Slight fever is at times present, with headache and general malaise. Loss of appetite succeeds, the tongue is furred, there is an unpleasant taste in the mouth, and more or less uneasiness referable to the digestive organs for some days. This class of cases requires only some mild evacuant remedy, the diet being regulated for a few days. The old-fashioned prescription of Mr. Abernethy, of a blue-pill and black draught, may still be employed in such cases with great success. In another class of cases the appetite is impaired or lost ; there is nausea with slight vomiting, and often a liquid containing bile is rejected. The bowels may be loose or

confined. A bitter taste is complained of, and a sensation of undefined distress is felt in the vicinity of the stomach; headache is frequent. Lithates often abound in the urine. The countenance is sometimes of a sallow hue. It is probable that many cases of acute dyspepsia are associated with subacute gastritis. In this latter class a mercurial cathartic will often procure speedy relief, but digestion will, in general, readjust itself without medication. Mild purgatives, followed by quinine with a regulated diet, are the appropriate measures of treatment.

CHRONIC DYSPEPSIA.

This condition is of much greater persistence than the preceding. The most prominent symptoms are arranged under the following heads:—Regurgitations (including pyrosis), cardialgia, tympanites and vomiting.

The regurgitations are sometimes intensely sour, at other times acrid, appearing to scald the throat; or they may be greasy or nauseous, or tasting and smelling like rotten eggs. Regurgitation of much liquid, which is insipid, saltish, and sometimes acid, occurring usually in the morning, and when the stomach is empty, is termed water-brash, or **Pyrosis**.

Cardialgia, vulgarly termed heart-burn, implies pain at the cardiac orifice of the stomach, of a burning character, shooting into the chest, and up the œsophagus into the throat. It is evidently dependent upon acidity, since it is relieved by alkaline remedies.

Tympanites, or distension by air or gas, is a prominent symptom in certain cases of chronic dyspepsia. It may be seated in the small intestines or stomach,

and, if considerable, causes pain, embarrasses the respiration, and disturbs the heart's action, sometimes causing palpitation.

Vomiting is not so common in chronic dyspepsia as in the acute form, and when it does occur, it is generally observed in young females.

An uncomfortable feeling of dulness or heaviness of mind is often present, accompanied by great depression of spirits. Palpitation with irregular action of the heart is often very distressing. Sleeplessness at night and dry cough are often very troublesome symptoms.

Causes.—Excessive drinking and eating, and errors in diet, are *direct* causes.

Indirect causes are the following :—

Anæmia. Anxiety and depression of mind.

Sedentary habits and want of exercise.

Conditions of life involving discontent and ennui.

Treatment.—Remove or obviate the causes as much as possible ; thus three measures of treatment are demanded, viz. :—

(1) Regulation of regimen and diet. (2) Measures addressed to the mind. (3) Medicinal remedies.

(1.) As regards the first measure : a short rest to the digestive organs by the reduction of the diet for a time below the requirements of the system, is often useful. The diet must be regulated according to each individual case. In most cases animal food, especially if the disorder is gastric, is best digested, but occasionally where the intestine is the seat, milk and farinaceous diet agree best : well-boiled rice and corn-meal mash are easily digested. Pastry, puddings and sweets should be avoided : regularity in meals and slow deliberate mastication are of great import-

ance : a moderate amount of liquid only should be taken with the meals. Tea and coffee especially are often injurious, as well as tobacco, since the latter substance arrests the secretion of the gastric juice, and, in many cases, acts deleteriously upon the nervous system. An alcoholic stimulant is often useful, but this must be cautiously administered. Exercise in the open air is most important.

(2.) The second indication may be fulfilled by removing as far as possible the mental causes, by enlisting the confidence of the patient by attention and sympathy, and by pleasant occupation of the mind.

(3.) In reference to drug medication ; morbid sensibility of the stomach may be treated by the application of small blisters, strong liquor ammoniæ, or croton oil to the surface. If anæmia be present, the preparations of iron, especially the perchloride, are indicated, or the citrate of iron and quinia. If there be constipation, the bowels must be gently moved, but purgation should be strictly avoided. A few drops of diluted hydrochloric acid before or after eating are often advantageous.

Pyrosis is generally relieved by full doses of some bismuth salt followed by or combined with tonics. The purified oxide of manganese, in doses of ten to thirty grains, thrice daily, is said by Dr. Leared to be even more efficacious than the above-named drug. Cardialgia requires alkaline remedies, as lime-water, liquor potassæ, bicarbonate of soda and magnesia ; carminative stimulants, aromatic powder and charcoal, are the indications for tympanites and flatulence. Opiates are required for the relief of present suffering.

Persistent vomiting may be checked by small doses

of diluted hydrocyanic acid, or by creasote, oxalate of cerium, and bismuth in large doses. Milk and lime-water are often retained when other kinds of food are rejected.

From a careful consideration of the foregoing statements, we may roughly divide dyspepsia into three varieties, viz. :

1. **Dyspepsia Acida, or Acid Dyspepsia**, in which the patient usually complains of a *sour* taste in the mouth, the tongue is coated with thick yellow fur, and in which the symptoms are relieved by alkalies.

2. **Dyspepsia Alkalina, or Alkaline Dyspepsia**, in which the taste complained of is usually *bitter*, the tongue frosted or lined by a thin layer of white fur, and in which the mineral acids afford the most relief.

3. **Dyspepsia Neutralis, or Neutral Dyspepsia**, in which no particular taste in the mouth is observed; the tongue may be clean, but in which there is vomiting of a clear, oily liquid (Pyrosis)—a form best treated by the salts of bismuth.

These divisions are of course only approximate, and deviations must be expected, but they will be found useful in a large majority of cases.

SARCINÆ.

This name is applied to a variety of vomiting in which a liquid is ejected from the stomach in greater or less abundance, having a sour taste and giving out an odour of fermenting wort, which, after a few hours, becomes coated by a mass of brownish froth resembling yeast.

Under the microscope, a vegetable fungus, known as *sarcina ventriculi*, and called by Robin, *merismopædia*

ventriculi, is discoverable. Sarcinæ (bundles) are oblong or square-shaped bodies, divided by lines into equal squares, and resembling a package tied by a cord. Sarcinæ may also be found in the urine, in some purulent discharges, and in the humours of the eye. They appear to be the result of fermentation, produced in the stomach from undue retention of its contents, by obstruction at the pylorus, and other causes. This fermentative process may be best checked by the hyposulphite of soda in doses of 15 grains to 1 drachm in water two or three times a day. The theory of the action of this remedy is that the hyposulphite unites with the hydrochloric acid of the gastric juice, chloride of sodium being formed, and sulphurous anhydride is set free; experiments have shown that fermentation is greatly retarded, if not wholly checked, by the presence of this last-named substance.

DISEASES OF THE INTESTINES—

ENTERITIS (*εντέρον*, the bowel; *itis*, inflammation).

Definition.—Inflammation of the mucous membrane of the small intestine.

Varieties.—(1) Idiopathic and general. (2) Specific and more or less partial.

IDIOPATHIC ENTERITIS.

[This is a rare disease, the cases formerly referred to this head being now regarded either as accompaniments of peritonitis or occurring in connexion with typhoid fever.]

Symptoms.—There are rigors and chilliness, nausea, vomiting and thirst; the tongue is coated with white fur. There are heat and soreness of the abdomen, chiefly about the umbilicus and epigastrium, and the pain is increased on pressure. Frequent diarrhoea is the most troublesome and prominent symptom. The alvine discharges are always fluid, at first containing a large quantity of undigested matter, but eventually composed chiefly of watery mucus, sometimes streaked with blood. When the diarrhoea has continued for some time, griping pain and gurgling may be produced from the distension of the abdomen by flatus. There is always loss of appetite, and after all kinds of food either vomiting or purging is induced.

Causes.—Imperfect stomachal digestion, imperfectly formed or vitiated chyme passing into the intestines. The influence of weather, the summer season predisposing most to the disease; but external cold is also a

cause by which congestion of the mucous membrane is set up.

Treatment.—The disease, as limited above, is not a serious one, and the management of it presents no difficulties. A little saline medicine, such as the acetate of ammonia or the tartrate of potash, or some mild antacids, such as magnesia, soda, or chalk ; or a powder containing some hydrargyrum cum cretâ and rhubarb, will generally suffice ; but if there be much pain or griping, a small quantity of some opiate may be given, Dover's powder being a very useful drug, or a few drops of tincture of opium, or some spiritus chloroformi. Sickness may be allayed by diluted hydrocyanic acid, and if the diarrhœa should persist, the mineral astringents (acidum sulphuricum aromaticum, plumbi acetat, or cupri sulphas) are indicated. The diet should, of course, be carefully regulated, and should consist of eggs, beef-tea, milk, arrowroot, and ground rice, with occasionally a little brandy.

SPECIFIC ENTERITIS.

[This variety of enteritis is hardly to be distinguished from the intestinal disease characteristic of typhoid or enteric fever, and it is also commonly present as a concomitant of tubercular consumption and tabes mesenterica.]

In typhoid fever the glands known as Peyer's patches, towards the end of the ileum, are inflamed and ulcerated, often leading to perforation of the intestine ; in phthisis and tabes mesenterica any or all of the intestinal glands may be involved.

Symptoms.—There is very frequent purging of light coloured, watery stools, or of undigested food, or of matter resembling pea-soup in colour and consistence,

or of blood. There is usually pain in the abdomen, and gurgling, the latter symptom being observed in typhoid fever chiefly in the right iliac fossa; there is, also, in the last-named fever a blown condition of the abdomen, from flatulent distension.

Pathology.—The appearances of the enteric ulcer will be found in the appropriate place, but those of the tubercular ulceration are the following: Throughout the ileum there are large patches of ulceration at variable intervals, commencing as small round discrete ulcers at the upper part of the canal, and becoming confluent below into irregular patches which extend throughout the entire circumference of the canal.

Each ulcer is of an irregularly circular form, and bounded by a thick, raised, round, and inflammatory border. Internally the margin is irregular and continuous, with coarse granulations, between which are scattered little yellow masses of tuberculous matter firmly adherent to the base of the ulcer. Some of the ulcers may extend to the peritoneal coat, and their existence may be known before the intestines are opened by an irregular thickening and a corresponding irregularity of the peritoneum.

Treatment.—The treatment of this affection will be discussed under the appropriate heads; but it may be stated generally that the object of therapeutical measures should not be so much to arrest the diarrhœa, which is the prominent symptom, as to alter the morbid conditions existing in each case. Thus, in typhoid fever astringents are of very little service, and the remedies should consist of mild mercurials, small doses of Dover's powder, mild salines, occasional small doses of tincture of opium, and the cautious administration of wine or brandy; in the enteritis of tubercular

phthisis, cod-liver oil, with astringents and opium, and in tabes mesenterica, cod-liver oil, small doses of mild mercurials and rhubarb, are the most appropriate remedies. In all cases the utmost care should be taken to regulate the diet, solid food being always objectionable; milk, beef-tea, chicken broth, or veal broth should constitute the principal aliments, and this fluid nourishment should be continued, even after the symptoms appear to have abated, for a premature recourse to solid food will often bring about a return of the disease, and undo all the previous good which has been accomplished.

COLITIS. DYSENTERIA. DYSENTERY.

(δύς, with difficulty; ἔντερον, the bowel).

Definition.—A specific inflammation of the mucous membrane of the colon.

Varieties.—Acute and Chronic.

Symptoms.—Of the *Acute* form: the disease begins with rigors, followed by pyrexia; at times bilious diarrhoea sets in, which after a few days' continuance becomes incessant, blood, mucus, or white glairy matter mixed with blood, being discharged by the bowels; occasionally large masses of hardened faeces are passed by stool. There are simultaneously with these symptoms violent griping pains in the abdomen, with constant desire to go to stool, accompanied by tenesmus and cramps in the thighs. There is no headache, and the mind is unaffected, but restlessness, anxiety, and sleeplessness are well marked; the tongue is clean, the face flushed, the pulse quick and hard, the eye bright, and the skin moist and warm. This form of the disease sometimes proves fatal by collapse, but it often passes into the

tubes are filled with cells, fatty and granular matters, and sometimes with blood.

CHRONIC GASTRITIS.

Symptoms.—A burning sensation, or feeling of heat in the gastric region, with tenderness over the epigastrium, which is constant, *i.e.*, not present only during digestion. There is habitual thirst; stimulating articles of diet, and strong alcoholic drinks are not well borne. Nausea and vomiting are common. In making the diagnosis, chronic dyspepsia, and such structural affections of the stomach as ulcer and cancer must be excluded.

Causes.—Chronic gastritis may follow the inflammation induced by corrosive and acrid poisons, or from long-continued indulgence in spirit-drinking, or from long fasting, or too rigid dieting. Arsenic introduced into the stomach by absorption from an external wound may produce this condition. Other causes are venous congestion resulting from diseases of the liver, as cirrhosis, by which obstruction is occasioned; diseases of the heart; and renal disease, involving uræmia.

Pathology.—The whole stomach is globular and much thickened, especially at the pylorus, the walls not collapsing on section. If the inflammation is limited to the mucous membrane, this membrane is of a dark or slate-grey colour, the surface being uneven and warty, *i. e.*, *mammillated* and dense.

Under the microscope, at early periods the gastric tubes are observed to be firmly bound together, the blood-vessels being thickened and enlarged. At later periods fibrous tissue replaces the tubes, and atrophy

of the gastric tubes may be produced by the presence of the newly-formed fibres.

Treatment.—Remove the dietetic causes. A bland easily digested diet, such as eggs, milk, stale bread, and soft boiled rice. No meat or stimulants. Food should be taken in small quantities, and at short intervals. Remedies to soothe the inflamed membrane, viz. : small doses of the salts of morphia and bismuth, hydrocyanic acid, and hyoscyamus. After the cessation of inflammation, tonics and improved diet.

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Symptoms.—The diagnosis of ulceration of the stomach is often very uncertain and difficult, but the general symptoms are the following: There is pain at the pit of the stomach of a gnawing or burning

character, and limited to a circumscribed space, coming on immediately or soon after the reception of food (especially certain kinds of food, such as hot drinks and alcoholic liquids) continuing for an hour or more, and being relieved as the stomach becomes empty. Nausea, with vomiting of some liquid or of blood, is frequently observed. There is emaciation, and the aspect is unhealthy and expressive of suffering. In most cases the constitutional disturbance is only slight, and the first indication of disease may be hæmatemesis or even perforation of the stomach; occasionally the ulcer remains open for many years, eventually leading to perforation, but in other cases the ulcerative process is very rapid, perforation taking place within a few weeks from the formation of the ulcer. The ulcer is chiefly seated on the posterior wall of the stomach. When it is seated on the anterior wall, there is greater liability to perforation.

Causes.—The female sex are far more prone to this disease than the male. The simple perforating ulcer is generally found in the class of maid servants, between the ages of 18 and 25. The exciting causes are very obscure.

Terminations.—In recovery. In hæmorrhage followed by prolonged collapse or by fatal syncope; in death by perforation; in marasmus from constant vomiting.

About one in five cases will probably prove fatal by one of these modes.

Pathology.—The simple perforating ulcer is rarely smaller than a fourpenny piece or larger than a five-shilling piece. In shape it is generally oval or round, and presents the appearance of a shallow level pit, with a sharp, smooth, vertical edge, as if punched out.

The ulcerated space is largest in the mucous membrane, next in the muscular tissue, the shape being that of a funnel or cone ; and, if it pass through the peritoneum, the perforation then becomes a mere chink or pin-hole. The areolar tissue and mucous membrane are at times thickened by exudation of lymph, and the surrounding mucous membrane is occasionally inflamed. Perforation occurs in about one case in eight, the fatal result being often averted by adhesion of the bases of the ulcers to the liver, spleen, pancreas, mesentery, or diaphragm.

It must be borne in mind that under certain circumstances the coats of the stomach undergo *self-digestion*; in this case the mucous membrane may be partially or wholly dissolved by the gastric juice, pulpy or gelatinous softening results, ragged ulcers are formed, and finally ulceration takes place. The mucous membrane itself is thin, smooth, and more translucent than in the normal condition ; when it is entirely dissolved, the muscular coat is left bare, and its veins are gorged with black blood. A ragged aperture may at last be formed by the removal of all the coats of the organ, and the contents of the stomach will then pass into the peritoneum.

Self-digestion of the stomach is observed in persons who have died suddenly during the process of digestion, or in those who have died from phthisis or brain diseases.

Treatment of Gastric Ulcer.—A strictly regulated diet ; the complete exclusion of solid food, bland farinaceous substances with milk being employed. Nourishment should be given in small quantities at a time and at short intervals. Spirituous liquors and hot fluids must be avoided. *Tenderness on pressure* may

be alleviated by blisters or mustard poultices, and *constant pain* may be relieved by the preparations of opium or morphia; *pyrosis* will be best treated by the salts of bismuth, and for *distressing vomiting* diluted hydrocyanic acid will be found of great service. If *constipation* be present, castor oil is very beneficial, and *diarrhœa* may be checked by the pulvis kino compositus.

CANCER OF THE STOMACH.

This affection is very rare under thirty years of age.

The stomach may be the seat of various forms of cancer—namely, scirrhus or hard; medullary or soft; and colloid or gelatiniform. The most frequent seat of scirrhus is at the pylorus, at which it forms a hard cartilaginous tumour surrounding and occluding the duodenal aperture. At the cardia the cancer is always of the medullary variety, and here it forms a soft, vascular tumour. Colloid cancer is found in large jelly-like masses.

When the pylorus is affected, the stomach is much expanded and hypertrophied; the vomited matters are fermented and frothy, containing sarcinæ, and the pain comes on some time after the reception of food. When the cardia is the seat of disease, the organ is much contracted. The vomited matters contain altered blood, causing the so-called coffee-ground vomit. The pain is of a stabbing character, and occurs immediately after the reception of food. Cancerous elements may be found in the vomit in either variety.

Symptoms.—In the early stages the symptoms are very obscure; they are generally those of dyspepsia.

The patient becomes emaciated, and no relief is

afforded to the dyspepsia. The pain becomes of a gnawing, burning, or stabbing nature; there are fetid acid eructations. The ingesta are vomited, together with blood, mucus, or dark grumous or frothy matter. There is constipation, with retraction of the belly, which becomes flat and hard. The cancerous cachexia is observed in the colour and expression of the countenance. When the pylorus is affected (and this is most commonly the case), the passage of food into the intestine is arrested; it therefore accumulates and undergoes fermentation in the stomach, and produces distressing distension, which is occasionally relieved by copious vomiting. When the cancer is of the scirrhus variety a tumour, uneven, hard, and immovable, may be discovered, an inch or two below the liver to the right side, but it may in some cases be dragged to the left side.

Treatment.—This must be nourishing and palliative, consisting of new milk, or milk thickened with arrowroot, strong soups, jellies, or tripe boiled in milk; food should be taken frequently and in small quantities; nutritive enemata may be given, and cod-liver oil may be rubbed into the abdomen. If the pylorus is affected, remedies to arrest fermentation must be exhibited. In this case animal food is more suitable; stimulants are frequently necessary, and of these champagne and effervescing drinks are the best.

Narcotics and sedatives, especially hypodermic injections of morphia, are the chief indications, and anodyne plasters and fomentations may afford relief.

DYSPEPSIA (δύς, with difficulty; πέπω, to digest).

The train of symptoms included under the name of dyspepsia are frequently expressive of serious organic disease of the stomach, but they may also be occasioned by mere functional disturbance of that organ, and thus dyspepsia in most cases is only a functional disease. This affection may be divided into acute and chronic forms.

ACUTE DYSPEPSIA.

This term is applied to disorder of the digestive organs, accompanied by comparatively violent symptoms and lasting only for a short period. It is commonly known as a *bilious attack* or a *fit of indigestion*. It is a condition arising from the ingestion of indigestible diet, over-repletion of the stomach, or by the digestive functions being arrested by fatigue, strong emotions, and other causes.

In some cases the symptoms are a sensation of fullness, weight, or pain in the epigastrium, with nausea and vomiting, followed by diarrhoea. Slight fever is at times present, with headache and general malaise. Loss of appetite succeeds, the tongue is furred, there is an unpleasant taste in the mouth, and more or less uneasiness referable to the digestive organs for some days. This class of cases requires only some mild evacuant remedy, the diet being regulated for a few days. The old-fashioned prescription of Mr. Abernethy, of a blue-pill and black draught, may still be employed in such cases with great success. In another class of cases the appetite is impaired or lost; there is nausea with slight vomiting, and often a liquid containing bile is rejected. The bowels may be loose or

confined. A bitter taste is complained of, and a sensation of undefined distress is felt in the vicinity of the stomach; headache is frequent. Lithates often abound in the urine. The countenance is sometimes of a sallow hue. It is probable that many cases of acute dyspepsia are associated with subacute gastritis. In this latter class a mercurial cathartic will often procure speedy relief, but digestion will, in general, readjust itself without medication. Mild purgatives, followed by quinine with a regulated diet, are the appropriate measures of treatment.

CHRONIC DYSPEPSIA.

This condition is of much greater persistence than the preceding. The most prominent symptoms are arranged under the following heads:—Regurgitations (including pyrosis), cardialgia, tympanites and vomiting.

The regurgitations are sometimes intensely sour, at other times acrid, appearing to scald the throat; or they may be greasy or nauseous, or tasting and smelling like rotten eggs. Regurgitation of much liquid, which is insipid, saltish, and sometimes acid, occurring usually in the morning, and when the stomach is empty, is termed water-brash, or **Pyrosis**.

Cardialgia, vulgarly termed heart-burn, implies pain at the cardiac orifice of the stomach, of a burning character, shooting into the chest, and up the œsophagus into the throat. It is evidently dependent upon acidity, since it is relieved by alkaline remedies.

Tympanites, or distension by air or gas, is a prominent symptom in certain cases of chronic dyspepsia. It may be seated in the small intestines or stomach,

and, if considerable, causes pain, embarrasses the respiration, and disturbs the heart's action, sometimes causing palpitation.

Vomiting is not so common in chronic dyspepsia as in the acute form, and when it does occur, it is generally observed in young females.

An uncomfortable feeling of dulness or heaviness of mind is often present, accompanied by great depression of spirits. Palpitation with irregular action of the heart is often very distressing. Sleeplessness at night and dry cough are often very troublesome symptoms.

Causes.—Excessive drinking and eating, and errors in diet, are *direct* causes.

Indirect causes are the following:—

Anæmia. Anxiety and depression of mind.

Sedentary habits and want of exercise.

Conditions of life involving discontent and ennui.

Treatment.—Remove or obviate the causes as much as possible; thus three measures of treatment are demanded, viz. :—

(1) Regulation of regimen and diet. (2) Measures addressed to the mind. (3) Medicinal remedies.

(1.) As regards the first measure: a short rest to the digestive organs by the reduction of the diet for a time below the requirements of the system, is often useful. The diet must be regulated according to each individual case. In most cases animal food, especially if the disorder is gastric, is best digested, but occasionally where the intestine is the seat, milk and farinaceous diet agree best: well-boiled rice and corn-meal mash are easily digested. Pastry, puddings and sweets should be avoided: regularity in meals and slow deliberate mastication are of great import-

ance : a moderate amount of liquid only should be taken with the meals. Tea and coffee especially are often injurious, as well as tobacco, since the latter substance arrests the secretion of the gastric juice, and, in many cases, acts deleteriously upon the nervous system. An alcoholic stimulant is often useful, but this must be cautiously administered. Exercise in the open air is most important.

(2.) The second indication may be fulfilled by removing as far as possible the mental causes, by enlisting the confidence of the patient by attention and sympathy, and by pleasant occupation of the mind.

(3.) In reference to drug medication ; morbid sensibility of the stomach may be treated by the application of small blisters, strong liquor ammoniæ, or croton oil to the surface. If anæmia be present, the preparations of iron, especially the perchloride, are indicated, or the citrate of iron and quinia. If there be constipation, the bowels must be gently moved, but purgation should be strictly avoided. A few drops of diluted hydrochloric acid before or after eating are often advantageous.

Pyrosis is generally relieved by full doses of some bismuth salt followed by or combined with tonics. The purified oxide of manganese, in doses* of ten to thirty grains, thrice daily, is said by Dr. Leared to be even more efficacious than the above-named drug. Cardialgia requires alkaline remedies, as lime-water, liquor potassæ, bicarbonate of soda and magnesia ; carminative stimulants, aromatic powder and charcoal, are the indications for tympanites and flatulence. Opiates are required for the relief of present suffering.

Persistent vomiting may be checked by small doses

of diluted hydrocyanic acid, or by creasote, oxalate of cerium, and bismuth in large doses. Milk and lime-water are often retained when other kinds of food are rejected.

From a careful consideration of the foregoing statements, we may roughly divide dyspepsia into three varieties, viz. :

1. **Dyspepsia Acida, or Acid Dyspepsia**, in which the patient usually complains of a *sour* taste in the mouth, the tongue is coated with thick yellow fur, and in which the symptoms are relieved by alkalies.

2. **Dyspepsia Alkalina, or Alkaline Dyspepsia**, in which the taste complained of is usually *bitter*, the tongue frosted or lined by a thin layer of white fur, and in which the mineral acids afford the most relief.

3. **Dyspepsia Neutralis, or Neutral Dyspepsia**, in which no particular taste in the mouth is observed ; the tongue may be clean, but in which there is vomiting of a clear, oily liquid (Pyrosis)—a form best treated by the salts of bismuth.

These divisions are of course only approximate, and deviations must be expected, but they will be found useful in a large majority of cases.

SARCINÆ.

This name is applied to a variety of vomiting in which a liquid is ejected from the stomach in greater or less abundance, having a sour taste and giving out an odour of fermenting wort, which, after a few hours, becomes coated by a mass of brownish froth resembling yeast.

Under the microscope, a vegetable fungus, known as *sarcina ventriculi*, and called by Robin, *merismopædia*

ventriculi, is discoverable. Sarcinæ (bundles) are oblong or square-shaped bodies, divided by lines into equal squares, and resembling a package tied by a cord. Sarcinæ may also be found in the urine, in some purulent discharges, and in the humours of the eye. They appear to be the result of fermentation, produced in the stomach from undue retention of its contents, by obstruction at the pylorus, and other causes. This fermentative process may be best checked by the hyposulphite of soda in doses of 15 grains to 1 drachm in water two or three times a day. The theory of the action of this remedy is that the hyposulphite unites with the hydrochloric acid of the gastric juice, chloride of sodium being formed, and sulphurous anhydride is set free; experiments have shown that fermentation is greatly retarded, if not wholly checked, by the presence of this last-named substance.

DISEASES OF THE INTESTINES—

ENTERITIS (*ἐντέρον*, the bowel; *itis*, inflammation).

Definition.—Inflammation of the mucous membrane of the small intestine.

Varieties.—(1) Idiopathic and general. (2) Specific and more or less partial.

IDIOPATHIC ENTERITIS.

[This is a rare disease, the cases formerly referred to this head being now regarded either as accompaniments of peritonitis or occurring in connexion with typhoid fever.]

Symptoms.—There are rigors and chilliness, nausea, vomiting and thirst; the tongue is coated with white fur. There are heat and soreness of the abdomen, chiefly about the umbilicus and epigastrium, and the pain is increased on pressure. Frequent diarrhœa is the most troublesome and prominent symptom. The alvine discharges are always fluid, at first containing a large quantity of undigested matter, but eventually composed chiefly of watery mucus, sometimes streaked with blood. When the diarrhœa has continued for some time, griping pain and gurgling may be produced from the distension of the abdomen by flatus. There is always loss of appetite, and after all kinds of food either vomiting or purging is induced.

Causes.—Imperfect stomachal digestion, imperfectly formed or vitiated chyme passing into the intestines. The influence of weather, the summer season predisposing most to the disease; but external cold is also a

cause by which congestion of the mucous membrane is set up.

Treatment.—The disease, as limited above, is not a serious one, and the management of it presents no difficulties. A little saline medicine, such as the acetate of ammonia or the tartrate of potash, or some mild antacids, such as magnesia, soda, or chalk ; or a powder containing some hydrargyrum cum cretâ and rhubarb, will generally suffice ; but if there be much pain or griping, a small quantity of some opiate may be given, Dover's powder being a very useful drug, or a few drops of tincture of opium, or some spiritus chloroformi. Sickness may be allayed by diluted hydrocyanic acid, and if the diarrhœa should persist, the mineral astringents (acidum sulphuricum aromaticum, plumbi acetas, or cupri sulphas) are indicated. The diet should, of course, be carefully regulated, and should consist of eggs, beef-tea, milk, arrowroot, and ground rice, with occasionally a little brandy.

SPECIFIC ENTERITIS.

[This variety of enteritis is hardly to be distinguished from the intestinal disease characteristic of typhoid or enteric fever, and it is also commonly present as a concomitant of tubercular consumption and tabes mesenterica.]

In typhoid fever the glands known as Peyer's patches, towards the end of the ileum, are inflamed and ulcerated, often leading to perforation of the intestine ; in phthisis and tabes mesenterica any or all of the intestinal glands may be involved.

Symptoms.—There is very frequent purging of light coloured, watery stools, or of undigested food, or of matter resembling pea-soup in colour and consistence,

or of blood. There is usually pain in the abdomen, and gurgling, the latter symptom being observed in typhoid fever chiefly in the right iliac fossa; there is, also, in the last-named fever a blown condition of the abdomen, from flatulent distension.

Pathology.—The appearances of the enteric ulcer will be found in the appropriate place, but those of the tubercular ulceration are the following: Throughout the ileum there are large patches of ulceration at variable intervals, commencing as small round discrete ulcers at the upper part of the canal, and becoming confluent below into irregular patches which extend throughout the entire circumference of the canal.

Each ulcer is of an irregularly circular form, and bounded by a thick, raised, round, and inflammatory border. Internally the margin is irregular and continuous, with coarse granulations, between which are scattered little yellow masses of tuberculous matter firmly adherent to the base of the ulcer. Some of the ulcers may extend to the peritoneal coat, and their existence may be known before the intestines are opened by an irregular thickening and a corresponding irregularity of the peritoneum.

Treatment.—The treatment of this affection will be discussed under the appropriate heads; but it may be stated generally that the object of therapeutical measures should not be so much to arrest the diarrhœa, which is the prominent symptom, as to alter the morbid conditions existing in each case. Thus, in typhoid fever astringents are of very little service, and the remedies should consist of mild mercurials, small doses of Dover's powder, mild salines, occasional small doses of tincture of opium, and the cautious administration of wine or brandy; in the enteritis of tubercular

phthisis, cod-liver oil, with astringents and opium, and in tabes mesenterica, cod-liver oil, small doses of mild mercurials and rhubarb, are the most appropriate remedies. In all cases the utmost care should be taken to regulate the diet, solid food being always objectionable; milk, beef-tea, chicken broth, or veal broth should constitute the principal aliments, and this fluid nourishment should be continued, even after the symptoms appear to have abated, for a premature recourse to solid food will often bring about a return of the disease, and undo all the previous good which has been accomplished.

COLITIS. DYSENTERIA. DYSENTERY.

(δύς, with difficulty; ἔντερον, the bowel).

Definition.—A specific inflammation of the mucous membrane of the colon.

Varieties.—Acute and Chronic.

Symptoms.—Of the *Acute* form: the disease begins with rigors, followed by pyrexia; at times bilious diarrhoea sets in, which after a few days' continuance becomes incessant, blood, mucus, or white glairy matter mixed with blood, being discharged by the bowels; occasionally large masses of hardened fæces are passed by stool. There are simultaneously with these symptoms violent griping pains in the abdomen, with constant desire to go to stool, accompanied by tenesmus and cramps in the thighs. There is no headache, and the mind is unaffected, but restlessness, anxiety, and sleeplessness are well marked; the tongue is clean, the face flushed, the pulse quick and hard, the eye bright, and the skin moist and warm. This form of the disease sometimes proves fatal by collapse, but it often passes into the

DISEASES OF THE PERITONEUM.

PERITONITIS (*περιτρένω*, to stretch around).

Definition.—Inflammation of the peritoneum.

Varieties.—1. Simple. 2. Tubercular.

SIMPLE PERITONITIS.

Symptoms.—There are rigors, followed by pain, commencing in a certain part of the abdomen and rapidly extending over the whole surface, increased by pressure or movement, at times so severe that the weight of the bed-clothes is insupportable.

There is great heat of skin over the abdomen, which is often tympanitic; the pulse is usually *wiry*; the expression of the countenance is pinched and anxious, and expressive of great suffering; the bowels are confined; the urine is high-coloured and scanty; the tongue is at first white, becoming dry and brown, the edges and tip being red; the patient lies upon the back with the thighs flexed upon the abdomen; the respiration is difficult and rapid (40 or 60 respirations in the minute), and chiefly thoracic; vomiting and nausea are generally present.

In some cases it is stated that when the stethoscope is placed over the inflamed part a friction sound may be heard.

Death may occur in 24 or 48 hours, and results from asthenia, being preceded by a sudden cessation of the pain, the abdomen becoming distended by gas or liquid, coffee-coloured fluid being vomited, and the extremities becoming cold.

Causes.—Cold, injuries to the abdomen, wounds and surgical operations, parturition, rupture of any of the abdominal viscera, perforation of the stomach or intestines, and renal disease.

Terminations.—If peritonitis result from common and transient causes it may end in complete recovery, but when from some of the causes above enumerated, it is generally, if not always, fatal.

Pathology.—The peritoneal vessels are injected; the surface of the serous membrane is covered by coagulable lymph, or flakes of lymph, floating in pus or serum; the intestinal folds are bound by coagulable lymph to each other, or to neighbouring viscera. Plastic lymph is thrown out around the intestines, and this, becoming organised, glues them together and produces obstinate constipation, no peristaltic movements being capable of performance by the firmly bound intestines.

Treatment.—Leeches may be applied to the abdomen, with warm fomentations; calomel and opium, or castor oil, may be given internally, and the large intestines may be evacuated by enemata of warm gruel or warm water.

TUBERCULAR PERITONITIS.

Symptoms.—These are very insidious; gradual enlargement of the abdomen takes place until considerable ascites is present, being caused by effusion of lymph and serum. The health fails, sweating, emaciation, and diarrhœa, alternating with constipation, set in. There is tenseness, pain and tenderness in the abdomen. The pain is colicky, and intermittent in character; obscure fluctuation may be found, usually

caused by the transmission of the manual impulse by the agglutinated masses of the intestine, and is seldom, if ever, due to ascites. If a tumour can be detected, this is usually seated in the omentum. The tongue may be fairly clean, the appetite moderate, and the bowels somewhat irregular; as the effusion increases the skin becomes hot, and the pulse quick. The breath is short, and the strength much reduced. There are great emaciation and diarrhoea, death soon resulting from exhaustion or from the supervention of some tubercular affection.

Tubercular Mesenteritis, or Tabes Mesenterica, is the name applied to the variety of this disease in which the folds of the mesentery and the mesenteric glands are the chief seats of the tuberculous matter. In this case it may be possible to feel hard nodular tumours through the abdominal parietes, and the principal symptoms are swelling of the abdomen, emaciation, and extreme pallor of the surface. Ascites is only a prominent symptom in the later stages of this variety. It is usually followed, sooner or later, by symptoms of pulmonary consumption.

It may be divided into three stages:—

(1) An incipient stage, in which there is enlargement of the glands, but the general health is as yet undisturbed, and the digestive organs are not distinctly deranged.

(2) A stage of farther advancement, in which the glands of the mesentery are frequently enlarged, and the digestive derangements decidedly marked.

In this stage the stools present the white colour so often exhibited in this disease.

(3) A stage in which the mesenteric glands become irritated and suppurate, inflammatory affections of the

intestinal mucous membrane arise, the emaciation becomes excessive, and the disease terminates in colliquative sweats and diarrhœa.

This disease is usually regarded as of a scrofulous nature, but its origin and complications are often of an inflammatory character.

Pathology.—In recent cases the peritoneum is found filled with clear serum, and the peritoneal investment of the intestines is studded with miliary tubercles. There is more or less enlargement and hardening of the mesenteric glands. In cases of long standing there is great enlargement of the mesenteric glands, with the formation of hard matted nodular masses, which, when opened, are found softened in the centres. Tubercular ulceration is also often found in the mucous membrane of the small intestines.

Treatment.—This must consist in supporting the general health and combating the symptoms as they arise. Pain and tenderness may be relieved by the application of linseed poultices to the abdomen. Obstinate diarrhœa may be controlled by catechu or krameria, and the diet should consist of milk, rice, and arrowroot. The preparations of iron, especially the iodide, in combination with cod-liver oil, are of great service; and infrictions of cod-liver oil and iodine unguents into the abdomen and thighs may prove beneficial.

ASCITES. ABDOMINAL DROPSY (*ἀσκις*, a leather sack or wine-skin).

Symptoms.—An enlargement of the abdomen, which is progressive and uniform, and accompanied by tension of the walls, and dulness over the whole abdomen if much fluid is present. If a small amount of fluid exists,

there is only dulness over the part to which the position of the patient admits of its subsiding, the rest of the abdomen being hyper-resonant. Fluctuation, as the amount of fluid increases, becomes more and more distinct. The pressure of the fluid gives rise to dyspnœa, injection of the eyes and suffusion of the face, together with enlargement and prominence of the superficial veins of the abdomen. There are not unfrequently dry skin, thirst, torpid bowels and diminished secretion of urine.

Causes.—Those of general dropsy. Any disease which obstructs the portal circulation. Obstructive diseases of the liver, especially cirrhosis; cancer of the pancreas, in which the portal vein is involved. Diseases of the mesenteric glands and of the spleen, heart, and kidneys; scarlatina, peritonitis, and atony of the peritoneum following pregnancy; local injury, or amyloid degeneration of the liver, by which obstruction is caused to the free passage of blood through the vena portæ; malignant disease of the omentum; anæmia.

Ascites is distinguished from *Ovarian Dropsy* by the enlargement being uniform and the width of the abdomen greater, and by its swaying from side to side in accordance with the position of the patient.

When the intestines are filled with air (*Tympanites*) they float on the surface of the fluid, and yield to the superior parts of the abdomen tympanitic resonance.

Anasarca is often combined with Ascites.

ABDOMINAL TUMOURS.

In the recognition of tumours of the abdomen, the first point is to decide whether the

1. Enlargement is general and uniform. This may be caused by Tympanites, or abnormal amount of air in the stomach and intestines, by fluid in the peritoneum, or by a solid tumour.

Tympanites is recognised by a general and uniform enlargement of the abdomen, and the percussion sound is everywhere tympanitic. It may be caused by atony of the colon, by tubercular disease of the peritoneum, or by intestinal obstruction.

Fluid in the Peritoneum is known by the enlargement being also general and uniform, but the percussion sound is dull, and fluctuation may be discoverable.

Ascites may be mistaken for ovarian enlargement, a greatly distended bladder, or a cyst in connexion with the kidneys.

Renal cysts are usually seated at one side of the abdomen, and on percussion a clear sound is yielded on the opposite side in every position of the body.

A solid tumour of sufficient size to occupy the whole abdomen is usually malignant in its nature.

2. A tumour localised and confined to one part of the abdomen may be due to faecal accumulations. These feel soft and doughy. They may resemble malignant or other tumours, and are frequently seated in the sigmoid flexure of the colon or in the cæcum.

An abdominal tumour may be masked by ascites.

When the existence of a tumour in the abdomen has been conclusively determined, it is important to consider what organs are found in the region in which

it is situated, and to make out its connexion with one of them.

Another point is whether the tumour moves during respiration, or whether it is fixed. If fixed, it may be associated with some movable organ which has become attached by adhesions, or it may be an enlargement of some structure, as the kidney, the lymphatic glands, or the aorta, which are retained permanently in their position. If it be movable, it is connected with the diaphragm, or with an organ which, during inspiration, is depressed, such as the stomach, liver, spleen, the intestine or omentum.

If there has been frequent vomiting, with the ejection of much fermenting liquid, and the stomach is enlarged, it might be a hard tumour in connexion with the pylorus, although far away from its normal situation.

The tumours found in the various abdominal regions are the following.

Tumours of the Right Hypochondrium. —

Tumours of the kidney, liver, and gall-bladder are usually found in this situation.

Displacement of the liver may be occasioned by fluid in the pericardium, effusion into the right pleura, or emphysema, or dilatation of the heart, and thus enlargement of the organ may be simulated.

The tumour may be due to congestion of the liver, cirrhosis in an early stage, lardaceous degeneration, abscess, cancer, hydatid cysts, cancer and dilatation of the gall-bladder. Cancer, hydatids, and diseases of the gall-bladder, may be mistaken for tumours of other organs. Tumours of the kidney may arise from dilatation, cancer, and cystic disease.

If the tumour originates in the liver, it is not en-

veloped by intestines, it is continuous with this organ, and ascites or jaundice is usually present. If the kidney is the part affected, some of it is generally clear on percussion, since a portion of the colon lies in front of it ; pus or blood has been discovered in the urine, or there has been stricture, calculus, or disease of the bladder, or of the testis or prostate gland.

Encephaloid disease of the kidney in children is extremely difficult to recognise, since, the tumour being situated behind the intestines, it appears to present several distinct swellings, and no pus or blood may be discovered.

Tumours of the Epigastrium.—

In this region tumours of the liver are generally found. A tumour caused by cancer of the stomach is known by its irregularity and hardness, and by the other characteristics of cancer generally. Cancer of the pancreas sometimes forms a tumour. Its symptoms vary greatly, and its recognition is very difficult, since so many other structures are implicated. In some instances no external tumour has been apparent ; the urine has been saccharine, and much fat has been found in the stools.

Tumours of the Left Hypochondrium.—

Fæcal accumulations, enlargements of the liver, spleen, and kidneys are most frequently found in this situation.

The position and size of the spleen are ascertained by percussion and palpation. The patient should lie on the right side, with the knees bent and drawn upwards, the hands being pressed deeply below the left costal arch during a full breath. If the spleen can be felt below the ribs, it may be assumed to be enlarged. The percussion of the spleen is always a

difficult matter. Normally this organ extends from the left kidney to the level of a line drawn perpendicularly downward from the anterior border of the left axilla, its upper and lower margins nearly corresponding with the ninth and eleventh ribs. Only the lower two-thirds can be determined, since the upper third is covered by the lower border of the left lung.

The organ should be percussed whilst the patient is lying or standing on his right side. The finger should strike lightly, and the dulness should be sought first at the ninth rib, in the middle axillary line, and traced gradually downwards.

In many cases the enlargement is only slight, as when it results from typhoid, typhus, relapsing fevers, pyæmia, etc.; but when due to lardaceous disease, or malarial influences, the increase is very great, and a tumour may be found which fills a large part of the abdomen.

Enlarged spleen may be mistaken for a tumour of the left kidney. The former, however, is not covered by the colon, is quite dull on percussion, and during respiration moves readily; its anterior margin is sharp and frequently notched, whereas, in the case of the kidney, the margin is round. Again, a tumour of the spleen can usually be moved forwards with the hand, and between its posterior border and the spine a space can be found.

Tumours of the Umbilical Region.—

Tumours in this situation usually arise from extension of growths in connexion with the stomach or liver.

Aneurisms of the aorta and its branches are usually found in this and in the epigastric regions. They are accompanied by severe neuralgia, systolic murmur, and a pulsating tumour. An increased pulsation of the

aorta is, however, met with in some cases of dyspepsia, especially in women, or a tumour may be situated over the aorta, by which vessel pulsation is communicated to it.

Tumours of the Lumbar Region.—

These are connected with faecal accumulations, or disease of the liver, spleen, and kidneys.

Sometimes inflammation of the cellular tissue around the kidney takes place, leading to abscess. Or a tumour may be found in the loins, arising from cancer implicating the lumbar glands or the spine. Tumour of the kidney nearly always increases anteriorly, in which position the pressure is least.

Tumours of the Iliac Region.—

Diseases of the cæcum, or perityphlitis, an inflammation of the cellular tissue around it, or ovarian disease, are most common in this locality.

Tumours of the Hypogastric Region.—

These are usually due to diseases of the uterus or bladder. In some cases of peritonitis, pus may be found in this situation enclosed in a sac formed by coils of intestines which have become adherent to one another.

DISEASES OF THE THROAT.

TONSILLITIS.

(*Tonsilla*, the tonsil ; *itis*, inflammation.)

Definition.—Inflammation of the tonsils.

Varieties.—(1) Acute. (2) Chronic.

ACUTE TONSILLITIS. QUINSY.

Symptoms.—There is usually a certain amount of fever, which varies in different cases, but is generally of a severe character. The temperature may rise to 104° Fab., or even higher. One or both tonsils are red, swollen, and tender to pressure, sometimes presenting greyish-yellow spots. There is enlargement of the uvula, and the back of the throat is filled with mucus ; swallowing is difficult and painful, and on attempting to swallow, there is a return of liquids through the nostrils, the speech being thick and almost inarticulate ; the skin is hot, the tongue is covered with creamy white fur, and the pulse is quick ; occasionally there is a painful sensation of tension, with darting pains in the ears, and pain along the course of the Eustachian tube. These symptoms usually last from five to seven days ; sometimes the larynx is attacked. The affection may terminate in resolution in about four days, but it more often goes on to suppuration, immediate relief being afforded upon the breaking of the abscess.

Causes.—Childhood and adult age (very rare after

forty years of age); but some persons appear to be specially predisposed to the complaint, and will suffer from an attack upon merely taking cold, or the attack will occur at regular intervals; long or loud singing is said to produce it, but of this there is considerable doubt.

Terminations. — In resolution, suppuration, or chronic enlargement.

Treatment. — When slight, the ordinary treatment of catarrh. If severe, scarification of the tonsils is of great service, as the bleeding is always followed by relief, and the application of leeches behind the angles of the jaw is a useful measure; a brisk purgative is often advisable, saline diaphoretics may be given, and inhalation of steam is beneficial.

The administration of drop doses of tincture of aconite, repeated every hour, is considered by some authors to be very efficacious, and guaiacum is useful in some cases. The general health should be sustained by port-wine, beef-tea, quinine, etc.

CHRONIC TONSILLITIS. HYPERTROPHY OF THE TONSILS.

This form may follow the acute, or succeed scarlatina, or arise spontaneously. It is a common occurrence in unhealthy constitutions, in weakly young women and strumous children, and in some forms of dyspepsia, or it may be caused by intemperance. The symptoms are a thick harsh voice, difficulty of breathing and swallowing, accompanied by deafness. The enlargement may be so considerable that the fauces seem to be blocked by the meeting of the glands.

The tonsils may be the seat of *Ulceration* in disordered conditions of the health, and this very often occurs as a secondary effect of Syphilis. The surrounding textures may be involved, viz., the nostrils, fauces, etc. The best mode of treatment is the application of solid nitrate of silver and the projection of the spray of medicated solutions into the throat, or the employment of a small mop made of soft linen, which is dipped into the medicated fluid and conveyed to the throat.

Certain drugs are useful, such as the iodide of potassium, the bromide of potassium, the chlorate of potash and chloride of ammonium. If remedies fail, the enlarged glands must be removed. In weak constitutions the general health should be kept up by good diet, cod-liver oil, the mineral acids and iron preparations.

LARYNGITIS.

Definition.—Inflammation of the larynx.

Varieties. — Acute, Sub-acute, Chronic, and a peculiar form called Infantile Laryngitis.

ACUTE LARYNGITIS.

Symptoms.—Acute Idiopathic Laryngitis is a somewhat rare disease, but the symptoms are the following: there is pain in the larynx aggravated by pressure, a full rapid pulse, general fever, great difficulty of breathing, stridulous cough and threatening of suffocation. In extreme cases the lips become livid, the voice is lost or reduced to a whisper. Coma and delirium may supervene, and death occur in a few days.

Causes.—Exposure to damp and cold (?); excessive use of the voice; the extension of inflammation from the vicinity of the larynx, as occurs in erysipelas, measles, small-pox, and scarlatina; mechanical and chemical irritants, such as drinking scalding water from a kettle, or swallowing mineral acids or caustic alkalies.

Treatment.—Bleeding, or leeches may be applied to the throat; tartar emetic in the form of *vinum antimoniale* may be given in doses of 10 to 20 minims in a saline mixture. Inhalations of steam with tincture of benzoin are advantageous, but the use of local remedies is doubtful.

Tincture of aconite may be given in drop doses every hour; wet compresses covered with oiled silk are sometimes serviceable. If œdema of the glottis takes place, scarification or tracheotomy must be performed.

Nutritive enemata are indicated if severe dysphagia is occasioned.

SUB-ACUTE LARYNGITIS.

This is a very common disease, and is usually idiopathic, occurring in cabmen, omnibus drivers, costermongers, singers and teachers of music, lecturers, seamen, etc., and all those who are exposed to vicissitudes of temperature.

Symptoms.—Those of a cold in the throat, followed by persistent irritation, troublesome cough, especially upon waking in the morning, excretion of much mucus, hoarseness of variable degree, and sometimes complete aphonia (loss of voice). Upon laryngoscopic examination, the whole mucous membrane appears of a deep red colour, and is everywhere swollen and infiltrated.

The vocal cords, instead of appearing brilliantly white, are as red as the rest of the tissues, or are entirely concealed by the tumefied ventricular bands, which may overlap them, looking like two ripe Morella cherries. The arytenoid cartilages are also swollen, red, and infiltrated, and in some instances the aperture of the glottis is scarcely visible. The vocal cords consist chiefly of yellow elastic tissue, covered by a delicate mucous membrane, but they normally appear of a white colour when seen by the laryngoscope, as compared with the pink mucous membrane by which they are surrounded. When inflamed, although they may only appear of a slight pink tinge, this apparently slight affection may seriously interfere with phonation and obstinately resist treatment.

The integrity of the vocal cords is essential to obtain flexibility in singing, and a slight inflammatory condition of these cords may cause a vocalist to sing sharp or flat, especially the latter.

Clergymen are very susceptible to sub-acute laryngitis, but the so-called clergyman's sore-throat, or dysphonia clericorum, must not be regarded as a special affection, since it is occasioned by the ordinary agencies which give rise to sub-acute laryngitis, and is perpetuated by a perseverance in using the impaired organ.

Treatment.—This is nearly always successful, but oftentimes tedious. The patient should abstain from spirituous liquors, use all fermented drinks in moderation, and desist from smoking, if he has acquired that habit. Complete rest of voice must be enjoined, cold should be avoided, and the patient kept, if possible, in a warm room and in a moist atmosphere. The local remedies should consist of strong solutions of iron

and zinc, but not of nitrate of silver; inhalations of benzoin and *pinus sylvestris*; and lozenges of *krameria*, tannic acid, and *ipecacuanha* are exceedingly serviceable.

CHRONIC LARYNGITIS.

This affection presents many characters of that last-mentioned, but its duration is much longer, and it often occurs as a result of those cases of the sub-acute form which have remained without treatment for a long period. The mucous membrane of the larynx is permanently thickened, the vocal cords are discoloured, and the cartilages are perhaps ossified. It is often complicated or caused by syphilitic disease or by phthisis, and is frequently associated with chronic bronchitis.

The cough may be of a rough, harsh and tearing nature. The voice is hoarse, becoming at night stridulous, or what is called croupy. The uvula is generally considerably relaxed and elongated, dropping over the trachea and tickling its orifice, so that when the patient is in a horizontal position it causes a frequently tearing cough, which may continue for some hours.

Occasionally, after frequent fits of coughing a pellet of darkish-coloured mucus is thrown up, the attack terminating abruptly; but in the majority of cases the paroxysm wears itself out, and in the middle of the night, or as the early morning advances, the patient falls asleep, being apparently well next day, but the attack may come on again the next night.

Treatment.—This is essentially the same as that of the sub-acute variety—viz., complete rest of the voice, a warm and moist atmosphere; soothing inhalations;

the local applications of astringents and alterative solutions. Internally, mild sedatives may be exhibited, combined with astringent, or expectorant, or demulcent lozenges.

Flannel should always be worn next to the skin, both in the summer and in the winter, and never left off. Chills must be carefully avoided. Generous diet must be given, and very small doses of morphia are often serviceable.

For a relaxed uvula, alum gargle or solution of chloride of iron, or glycerine of tannin, may be employed. Ice should be given to suck.

In some cases removal of the uvula is necessary.

When the chronic inflammation is of a specific character, which is very often the case, special remedies must be employed, both locally and generally. In the *syphilitic* forms, nitrate of silver or sulphate of copper must be applied in strong solutions, or the former in the solid state; and internally iodine and mercury must be administered, either together or separately. In the chronic laryngitis connected with phthisis (*laryngeal phthisis*) local remedies must be used with great caution, and if the solutions of iron or zinc be employed, they should be mixed with glycerine and lightly applied; small doses of morphia may be insufflated into the larynx; at the same time constitutional remedies should be given, such as cod-liver oil, iron, and quinine; the cough and other symptoms being treated by appropriate remedies.

INFANTILE LARYNGITIS.

This disease is very common among children, and is vulgarly called croup, and although essentially the same as the acute laryngitis of the adult, it presents

many peculiar features. The aperture of the glottis in children is very narrow, and in consequence *stridulous* breathing is very common, and hence the common name "croup."

The word *Croup* in itself implies nothing more than noisy or stridulous breathing. It is a Scotch word, and in Scotland, even at the present day, nothing is more common than to say to a person who has a cold, "Why, you are 'roupy' to-day," the words "roup" and "croup" being used indifferently. It has no medical or etymological significance, and might be advantageously struck out of our nosology. The word "croup" is highly objectionable, because it denotes different diseases in different countries; and in England does duty for at least three totally distinct affections, the only character in common being noisy breathing.

Infantile laryngitis is distinctly inflammatory, and presents the following symptoms: a child, usually from one or two to five years of age, may have previously suffered from catarrh and fever which has not attracted much attention; in the evening or middle of the night it suddenly wakes with a hoarse, suffocating cough and stridulous inspiration. The face is flushed, the skin hot and dry, the pulse full and strong, and the breathing difficult; there is urgent fear of suffocation. The above combination of symptoms constitutes the so-called croup: but notwithstanding the apparent urgency of these cases, nearly all of them recover.

After continuing for some hours, the symptoms abate, the child falls asleep, and upon waking little disturbance remains beyond a hoarse cough. The next night, perhaps, the attack returns, but with less severity, and after appropriate treatment complete recovery takes place.

Pathology.—There is inflammation of the larynx, usually extending more or less into the trachea, and even into the bronchial tubes. The mucous membrane is swollen, the sub-mucous tissue infiltrated, and the aperture of the glottis narrowed. In mild cases the inflamed parts return to their normal condition, but in other and rarer instances œdema of the glottis may result, demanding the operation of tracheotomy. In some cases, especially when complicated with pulmonary or cerebral mischief, œdema of the sub-mucous tissue is observed, the mucous membrane of the epiglottis and glottis containing serum or pus. It is stated that the vocal cords are often the seat of superficial ulcerations.

Causes.—Unfavourable atmospheric agencies; the winter season. It is not a contagious or infectious disease, but children placed under the same conditions of weather and exposure may be affected simultaneously.

Treatment.—This must be antiphlogistic. Tartar emetic may be given in doses of 10 minims of the vinum antimoniale, every three or four hours, or ipecacuanha may be administered. Cold and exposure must be avoided, and the patient placed in a warm and moist atmosphere.

LARYNGISMUS STRIDULUS (λαρυγγίζω, to bawl; *stridulus*, a creaking). **THYMIC ASTHMA.**
SPASMODIC CROUP.

Description.—This affection is characterised by a loud crowing inspiration, often coming on suddenly at night, threatening suffocation, and in some cases ending fatally. There is little or no feverishness, no

inflammation, no false membrane. The disease essentially consists in a spasmodic contraction of the glottis, thus narrowing the aperture, and occasioning the so-called croupy breathing. It exhibits a tendency to recur at intervals, frequently once or twice a year. The vocal cords are spasmodically closed, and unless the spasm can be relaxed the child dies of suffocation. Post-mortem examination may throw no light whatever upon the malady; and it is probable that the affection, in this respect, bears the same relation to diseases of the throat as asthma does to diseases of the lungs, and angina pectoris to diseases of the heart.

Causes.—Morbid influences acting at a distance from the larynx, such as the irritation of teething, or the presence of tumours pressing upon the recurrent laryngeal nerve; worms in the intestines, and unwholesome or unsuitable food are common causes. It is probably in many cases hereditary, and may often be observed in nervous, tubercular, and rickety children.

Treatment.—This must consist, during the paroxysm, in lancing the gums, and the use of the warm bath. The treatment afterwards should consist in the removal of worms, if they exist, the use of mild aperients and antacids, or weaning the child, since, in some cases, the milk of the mother disagrees. In many cases, however, the disease arises from the removal of the infant from the mother's breast, and in this case a wet-nurse is the best substitute.

DIPHTHERIA (*διφθέρια*, a skin or membrane).

Description.—This disease consists essentially in the formation of a distinct pellicle or false membrane, usually appearing first on the uvula, tonsils, or soft palate, and in some cases extending no further, when the disease is comparatively mild ; but should it extend downwards to the larynx or trachea, which is often the case, or even, as sometimes happens, to the bronchial tubes, it is dangerous and fatal in the highest degree.

A fatal result may arise from one of two causes : first, the presence of the false membrane in the larynx and trachea, by which the entrance of air into the lungs is prevented ; and secondly, by the agency of the specific poison, which destroys life by a toxic influence underlying the existence of visible local lesions.

Although diphtheria chiefly attacks the fauces and the respiratory tract, it is not limited to those situations, but it may affect the nose, the eyes, the ears, the œsophagus, the margins of the anus and vagina, and the skin. It is, nevertheless, especially a disease of the mucous membranes, and particularly of those parts of such membranes as are near one of the outlets of the body—that is, of parts exposed to the air.

The false membrane may be stripped off the back of the throat, leaving the subjacent parts spongy, swollen, and bleeding, upon which the membrane is soon renewed. The membrane itself presents several layers, the first formed becoming the most superficial, and the newest being the most deep seated.

Diphtheria is very capricious in its visitations, some-

times attacking whole communities, especially among children, with terrible and fatal results; but being sometimes entirely absent for many years, or appearing only in a sporadic form.

Diphtheria confined to the larynx and trachea is appropriately termed laryngo-tracheal diphtheria, and the affections with which this disease may be confounded are the following, viz. : Infantile laryngitis, and Laryngismus stridulus. The latter may be distinguished by the suddenness of the attack, the speedy convalescence, or death, and the absence of all false membrane. In infantile laryngitis the symptoms are those of acute inflammation of the air passages; there is hoarse loud barking cough, great dyspnœa, hot skin, a full and rapid pulse, and the attack is sudden, generally occurring in the night. Death by suffocation rarely occurs, although this result sometimes appears urgent, and, as a rule, the great majority of cases recover under appropriate treatment.

In laryngeal, or laryngo-tracheal diphtheria, the symptoms are, at first, apparently far less severe, and are frequently scarcely noticed. Hoarseness may be absent, and the dyspnœa not urgent, the voice is muffled, and the cough not loud. In fact, the symptoms may, at first, be called *insidious*. Still, the patient gradually becomes worse; there are fits of suffocation, sometimes accompanied by the expulsion of false membrane, and death ensues, either from absolute suffocation, or, what is quite as common, by the toxical effect of the diphtheritic poison. In some cases, although comparatively rarely, the disease commences in, and is confined to, the larynx and trachea, and the existence of the false membrane may not be recognised until tracheotomy has been per-

formed, or unless the patient dies and post-mortem examination reveals the true nature of the malady. Diphtheria is sometimes followed by paralysis of the soft palate, throat, eye, face, and limbs.

Diphtheria appears to be caused by a specific poison introduced from without, and first attacking the back of the throat, because that part first receives the air during the act of respiration. In epidemics of this disease the inspired air is laden with poison, and assuming that diphtheria is propagated by germs, the supposition is that these germs find a suitable soil in the mucous membrane of the throat, and that they increase and multiply there and elsewhere in the usual manner of vegetable and animal germs.

The subject of the relations between croup and diphtheria has occupied the attention of the medical world for many years past; but at the present day opinion is less divided than formerly, and the views first advanced some twenty years ago, are fast gaining ground—viz., that the so-called Membranous Croup is simply Laryngo-Tracheal Diphtheria.

The subject of the relations between croup and diphtheria has very recently been exhaustively considered in a discussion at the Royal Medical and Chirurgical Society. The occasion of the discussion was a paper read to the Society by my father, Dr. Robert Hunter Semple, who has long maintained the identity of membranous croup and laryngo-tracheal diphtheria, and a committee was appointed to report upon the subject. The report is a lengthy one, and contains a great mass of information, and the conclusions drawn, although cautiously expressed, point to the discontinuance of the word "croup" altogether, and to the substitution of other words having a more

definite meaning. The great mass of evidence collected leads to the belief that membranous croup (*i.e.*, laryngo-tracheal diphtheria) is of zymotic origin; and there is an almost total want of evidence that the ordinary causes of laryngeal inflammation give rise to diphtheria.

Treatment.—In the mild cases where the fauces only are affected, some local alterative should be employed, such as a strong solution of iron; but the constitutional treatment should never be neglected, because even in slight attacks the constitutional symptoms are often serious. Iron and quinine should, therefore, be given, and wine or brandy, and strong beef-tea be also administered. Where the disease attacks the larynx or trachea, the danger is increased a hundredfold, and there is little chance for the patient except in tracheotomy, by which the false membrane is removed.

The term "Croup," then, does duty for three totally different diseases, viz. :

(1) **Infantile Laryngitis, or Inflammatory Croup**, which is distinctly inflammatory, but in which there is no false membrane.

(2) **Laryngismus Stridulus, or Spasmodic Croup**, in which there is no inflammation, and no false membrane, but which merely consists in a spasmodic contraction of the vocal cords.

(3) **Laryngo-Tracheal Diphtheria, or Membranous Croup**, which is characterised by a distinct false membrane, but in which the inflammatory symptoms, in most cases, are by no means well marked, and for this last-named reason Bretonneau substituted the word *diphtheria* for diphtheritis.

In respect to the identity or non-identity of so-called "croup" and diphtheria, it is not attempted to assert that these affections are identical, because diphtheritic membrane is seen upon mucous surfaces remote from the larynx, and also upon ulcerated wounds; but inasmuch as no difference, microscopic or other, can be detected in the false membrane lining the larynx in *membranous* croup and *laryngo-tracheal* diphtheria, it is in the highest degree probable that *membranous* croup and *diphtheria confined to the larynx and trachea* are one and the same affection.

BRONCHOCELE. GOITRE.

This affection consists in an hypertrophy of the thyroid gland, *i.e.*, of its normal constituents, the blood-vessels, connective tissue, and vesicles. In some cases the whole of these components are increased in proportion, but the enlargement is usually confined to the vessels and connective tissue. The size may vary from simple fulness to considerable enlargement.

Bronchocele is peculiar to certain localities. It constitutes the Derbyshire neck of England, and the goitre of the Swiss. It is met with in Yorkshire, Nottinghamshire, and Sussex, and is apparently dependent upon the water being largely impregnated with carbonate and sulphate of lime, and possibly also upon some additional endemic malarial influence.

There is no pain; the bulk merely causes inconvenience. This bulk may, however, occasion serious indications, since pressure may be exerted upon the large veins, the pneumogastric, inferior laryngeal and sympathetic nerves, or upon the trachea and œsophagus.

Graves's or Basedow's disease consists in a peculiar enlargement of the thyroid body, which takes place in young women, and is accompanied by exophthalmos, or a projecting prominent eyeball, uterine derangement, and palpitation of the heart.

Causes.—It is rarely seen in advanced life, and it sometimes follows some acute affection or mental shock. It is probably connected with some disturbance of the sympathetic system, by which passive dilatation of the vessels of the neck and thyroid body is permitted, the blood supply of the orbit becoming implicated, and the activity of the heart excited. Morbid conditions of the sympathetic nerve in the neck have been observed in fatal cases.

At the commencement of the disease the symptoms may be gradual or sudden. In the former case, the eyes may appear more prominent, staring, and glistening, the protrusion becoming more and more marked, perhaps only in one eye, but usually in both eyes, until it is impossible to close the lids over them.

The protrusion is most noticeable during the menstrual period and at times of excitement.

The sight is not much affected. When the symptoms appear suddenly, palpitation of the heart soon appears. There is distressing pulsation of the arteries of the neck, and after the prominence of the eye appears the thyroid gland gradually increases, being usually accompanied by a thrill and a more or less distinct venous or arterial murmur, and extreme nervous irritation.

The disease is not usually fatal: it may remain stationary, or even end in actual recovery. It may, however, advance slowly, and death may result from some intercurrent disease of the lungs.

Treatment.—If the disease is due to endemic influence, the patient should be removed from the locality. Iodine preparations should be employed both internally and externally. In the exophthalmic variety, to alleviate the extreme palpitation digitalis may be exhibited, and iron preparations combined with belladonna have found favour.

It has been recommended in obstinate cases to adopt operative measures, such as passing a seton through, or even extirpating the gland.

WHOOPING-COUGH. PERTUSSIS.

Definition.—A spasmodic affection, both infectious and contagious, accompanied by a characteristic “whoop,” terminating in vomiting.

- (1) The **Catarrhal Stage**, or **Stage of Invasion**,
- (2) The **Spasmodic Stage**, or **Stage of Increase**; and
- (3) The **Terminal Stage**, or **Stage of Decline**, in which there is an amendment of all the symptoms.

The **Catarrhal Stage** usually presents the ordinary sign of simple catarrh, such as running at the eyes and nose, sneezing, and dry cough; but this last symptom has no special character.

There are, however, generally, more languor, irritability, and drowsiness, than in an ordinary case of catarrh. The duration of this stage is very variable, its probable average being about a fortnight, but it may continue for a much longer period.

In some few cases the characteristic features of the disease are exhibited from the first, the catarrhal stage being wanting.

In the **Spasmodic Stage**, the peculiar paroxysmal and convulsive nature of the affection is established. There are violent paroxysms of coughing, which

recur after variable intervals. Immediately before the attack the child is irritable and anxious, or very quiet, and at its commencement will frequently seize any fixed object by which it may support itself. The character of the cough is spasmodic, sonorous, and dry, and consists of numerous successive, rapid, and short expirations, the thorax being apparently emptied of the whole of its contained air by the violence of the expulsive efforts. One or two deep, long inspirations will succeed, being accompanied by the peculiar characteristic whoop, which is occasioned by the rapid and forcible drawing of the air through the spasmodically contracted glottis.

During the paroxysms, the face may become swollen and purple, and considerable exhaustion nearly always results. Almost invariably, ropy, colourless fluid, accompanied by vomiting, follows the fit of coughing.

In cases of extreme severity, hæmorrhages are not unfrequent from many situations, such as the ears, nose, mouth, and from the conjunctivæ.

The average duration of a paroxysm is from a quarter to three-quarters of a minute, but it may last for two minutes or even longer. It has been known, in one instance, to continue for fifty-five minutes.

The duration of this stage is about thirty to forty days.

The **Terminal Stage** is said to commence when the affection is evidently on the decline, general improvement taking place. Its duration is uncertain.

The **Symptoms** of pertussis may be summarised as follows: There is usually a febrile stage of eight, ten, or twenty days' duration, sometimes accompanied, but generally followed by, violent paroxysms of coughing,

with abundant sputa. The expiratory efforts are so powerful that the patient appears on the verge of suffocation until a long inspiratory act follows, the rush of air through the contracted glottis giving rise to the peculiar and characteristic whoop, the signal of the child's safety. As soon as the fit is over, the child is generally to all appearance well, and returns to its play. There may be two or three paroxysms a day, or as many in an hour, and even when the attack ends in vomiting, there is craving for food.

Complications.—Whooping-cough may coexist with measles, small-pox, bronchitis, pneumonia, disordered bowels, or some cerebral affection, and it may lead to emphysema and collapse of the pulmonary tissue.

Causes. — Whooping-cough generally occurs in children, and has been observed in the first weeks of life; adults, however, are not exempt, and persons of seventy and eighty years of age have been known to suffer from the affection.

It is said by Todd to be due to a specific poison acting upon the eighth pair of nerves.

It is propagated by direct contagion, and often appears in the form of an epidemic, attacking many children simultaneously.

The **Prognosis** depends upon the complications, since simple pertussis is rarely a fatal disease. The most dangerous complication is convulsions, next in order is bronchitis, and, lastly, pneumonia.

Pathology.—The only anatomical appearance is slight inflammation of the mucous membrane of the bronchial tubes, which are reddened, and thicker than in the normal state, and are filled with frothy mucous or thick viscid fluid.

Treatment.—This cannot be considered satisfactory.

Innumerable remedies have been employed, amongst them the following : *Sedatives*, tincture or extract of hyoscyamus or conium, syrup of poppies, extract of lettuce, or prussic acid, belladonna, and digitalis ; *Antispasmodics*, as musk, assafoetida and camphor, oil of amber ; *Alteratives*, as arsenic, alum, sulphate of zinc, and bromide of potassium. With respect to the majority of these remedies it has not inaptly been said, "Perhaps there is no disease for which so many *specifics* and infallible nostrums are promulgated with confidence, or so few actual remedies known."

It may, however, be stated in general terms that in uncomplicated cases of whooping-cough it will be useful to administer in the first place some mild alteratives and antacids, as hydrargyrum cum cretâ, soda, potash, and rhubarb, together with ipecacuanha in moderate and long-continued doses (five to ten minims, according to the age). In general, the disease lasts in spite of all remedies from a month to six weeks, but it may last much longer, in which case change of air will be found the most efficacious remedy, and not merely from an unhealthy to a healthy locality, but even *vice versâ*. It has been proposed, and the plan has been successfully carried out, to take sufferers from whooping-cough to the neighbourhood of gas works, the effluvia from which appear to exercise a beneficial influence over the disease. When pertussis is complicated, as it often is, with other affections, the appropriate remedies must be employed. Thus, in the strumous diathesis, cod-liver oil and iron preparations will be indicated.

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